



*Keyed To Quality and Locked Into Service<sup>SM</sup>*


KEY MACHINES

# ULTRACODE<sup>TM</sup>



**Reliable, Accurate & Loaded with Features ...  
The Ultimate Electronic Code Cutting Machine!**

Kaba Ilco Corp.  
400 Jeffreys Rd. • Rocky Mount, NC 27804  
Tel: 252-446-3321 • Fax: 252-446-4702 • [www.kaba-ilco.com](http://www.kaba-ilco.com)

A Member of the Kaba Group 



# The very best in electronic code cutting equipment ...

The Ultracode™ is an Electronic Key Cutting Machine for code cutting cylindrical, automotive, and flat keys. This revolutionary machine is able to operate stand-alone or connected to a personal computer in conjunction with Ilco's Kreate-A-Key™ code software. No other Electronic Key Machine better meets the demands of today's professional key cutting centers.

- **Duplication Function**

A patented Laser Optical Reader allows Ultracode operators to quickly and easily duplicate single and double-sided keys. (Reader equipped model only)

- **Extensive Code Database**

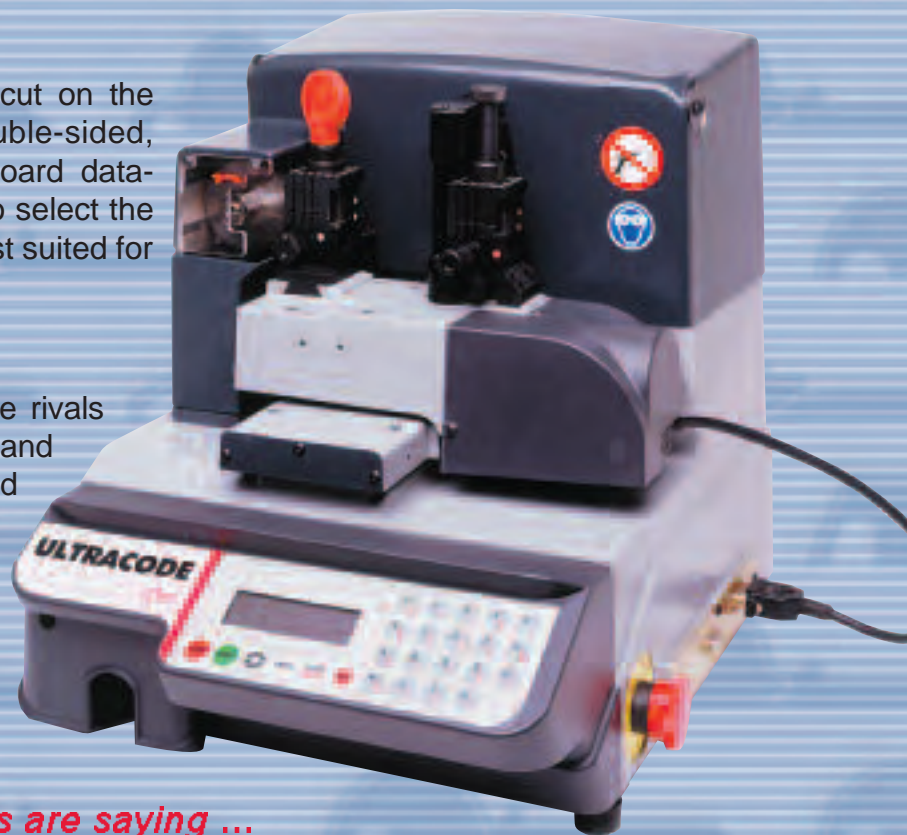
The Ultracode is pre-loaded with over 1300 digital depth and spacing data cards for the precise cutting of cylindrical and automotive keys. Up to 200 user defined (Design-A-Key™) data cards can be created without the need for a personal computer, further enhancing the machine's extensive capabilities and wide application range.

- **Variety of Cut Types**

A wide range of lock systems can be cut on the Ultracode including single-sided, double-sided, Medeco®, and Tibbe® keys. The on-board database and software allows the operator to select the cut type (laser, regular, flat or plunge) best suited for the selected application.

- **Speed and Precision**

No other Electronic Key Cutting Machine rivals the Ultracode's 14-second cycle time and +/- .001" tolerances. Users will be amazed by the constant speed and accuracy of the Ultracode machine.



## *Here's what current machine owners are saying ...*

*"Accuracy, speed and the ability to duplicate keys all in one tough package! It never quits."*

*Jeff Cooper, Atlanta, GA*

*"Have had it in my truck for over two years and haven't had to calibrate a thing."*

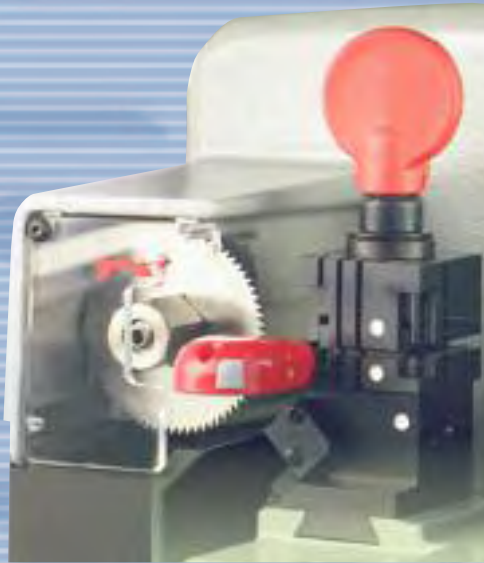
*Randy Mize, St. Louis, MO*

*"Used it every day for over three years now and still on the original cutter. Have never had to calibrate or re-set a thing."*

*Carl Stafford, Columbus, OH*



# Ultracode™ Exclusive Features



- **Electrical Contact**

The Ultracode utilizes an innovative system of electrical contact between the cutter and key for gauging and calibration purposes. Prior to cutting, the exclusive electrical contact feature allows the Ultracode to automatically identify the correct cut depth and position of the key regardless of the jaw side being used; a big advantage when cutting automotive keys!

- **Key Registration**

The Ultracode's exclusive Key Registration feature allows for double sided automotive keys to be securely clamped and cut without the use of gripping pins. This technology results in ease and flexibility when clamping keys.

- **Vise Jaw, Cutter & Axis Calibration**

The Ultracode automatically controls vise jaw, cutter and axis calibration. Minimal operator involvement is required.

- **Kreate-A-Key™ Code Software**

Ilco's Kreate-K-Key™ code software can communicate with an Ultracode by way of a personal computer. Kreate-A-Key™ contains the world's largest database of direct and indirect codes for automotive, commercial and residential key applications.

## Optional



### Adapters

Adapters for cutting a variety of lock systems are available including Abloy®, Abus®, Medeco®, Jaguar® and Porsche®.



### Carbide Cutter

Carbide cutters should be used when cutting steel keys ONLY. (please be aware that the Ultracode's pulleys will have to be reversed to properly run the Carbide cutter. Part No. D405933ZZ)

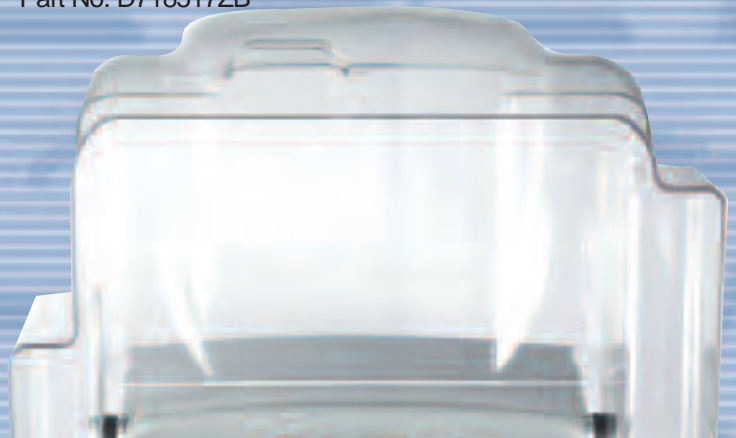
### Kreate-A-Key® Code Software

Enhance the capabilities of the Ultracode by connecting the machine to a personal computer and the world's largest database of direct & indirect key codes ... Kreate-A-Key™. Part No. BK0202XXXX



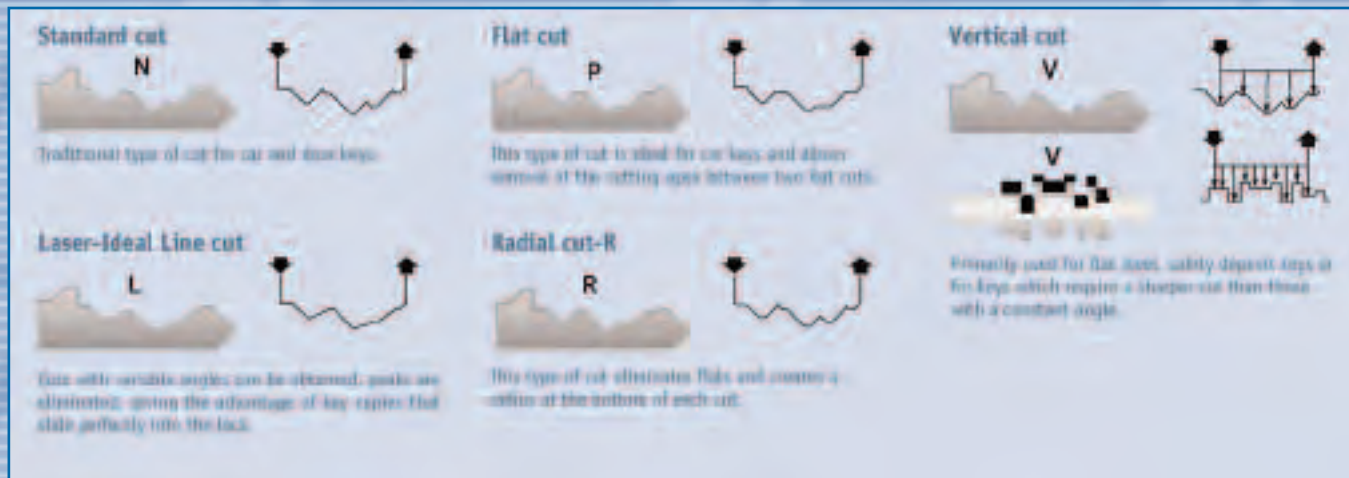
### Protective Shield Kit

A protective shield is available by special order only. Contact your Ilco Distributor for additional details. Part No. D718517ZB





## Types of Cuts



## Technical Data

Cutter Motor:	single phase and speed - 110V, 60Hz
Diagnostics	incorporated in the machine's internal program
Two axes:	X = spaces; Y = depths
Carriage movements:	on roller guides, controlled by step motors and sensors
Clamp:	four sides
Calibration:	by means of an electro-mechanical device
Standard Cutter:	D716549ZB (H.S.S.)
Dimensions:	width: 19.7", depth: 19.7", height: 16.5"
Weight:	81 lbs. (37 kg)

Cuts these key types: Automotive, Residential, Commercial



## Kreate-A-Key™ Software

The Kreate-A-Key™ Software Program is the easiest way to make keys by code. Forget the hassles with using code books and cards ... Ilco just made your life easier.



- **Most comprehensive direct and indirect code database in the market.**
- **Use Kreate-A-Key Premium Code Software stand Alone or with a Key Machine.**
- **Screens are easy to read and understand.**

The **Kreate-A-Key** software package comes on an auto install CD and provides reference information and application data on thousands of direct and indirect key code information for both automotive and commercial applications. **Kreate-A-Key** is a Windows application that requires Windows 95/98/2000/ME/XP or NT, and a CD-ROM drive. Minimum hardware requirements are a Pentium CPU, 64MB of Ram and 60MB of available hard disk space.

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# ULTRACODE



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## QUICK START GUIDE

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**ILCO**  
UNICAN®

Please read all instructions carefully before operating your Ultracode Key Machine.

## 1. Preparation

**A.** Begin by removing the ULTRACODE machine from its cardboard box. It is advisable to save the box and packing material for future transportation. After removing the ULTRACODE machine from the packing box, check the contents of the box, which should include the following:

- 1 ULTRACODE key cutting machine
- 1 set of documents including an operating manual, a spare parts list and a warranty card\*
- 1 ULTRACODE internal Card list
- 1 ULTRACODE Quick Start Guide
- 1 power supply cable
- 1 tool kit

\*The warranty card should be filled out and returned to Ilco Unican as soon as possible.



**INCORRECT!**

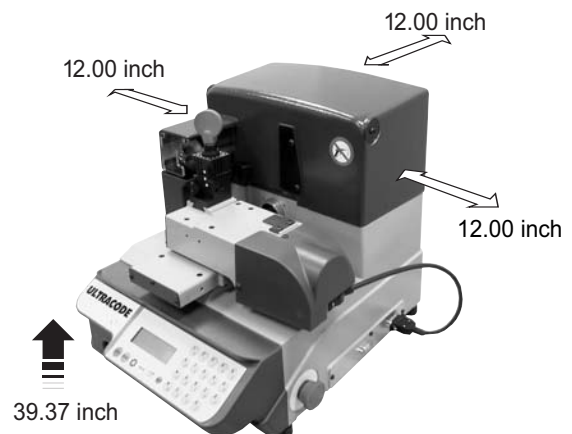


**CORRECT!**

**B.** When the ULTRACODE has been unpacked, place it directly on its work-bench; this operation should be carried out by at least two people. Carefully lift the machine, firmly holding the base and no other part. Never lift the machine by holding the keyboard stand.

**C.** Place the machine on a horizontal surface, solid enough to support the weight of 85 lbs (39kg). Ensure that the main's power supply is the same as that of the machine, 110V/AC. This supply should be properly grounded and the machine connected to a surge protected power strip.

**D.** The serial cable on the right hand side of the machine must be plugged into the (Y) port, also located on the right hand side of the machine. This allows the X & Y axis to function properly.



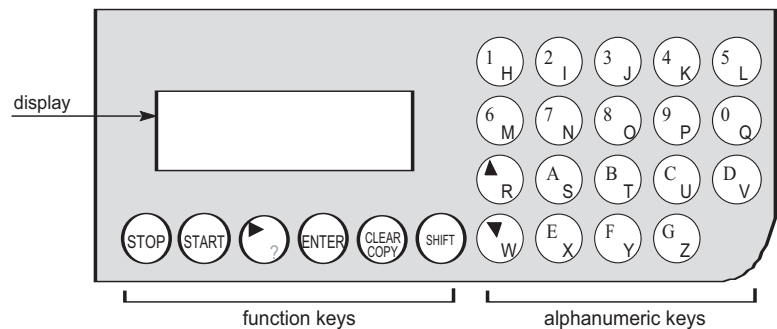
**E.** Attach the power cord to the ULTRACODE and plug it into an 110V/AC circuit. The on/off main rocker switch is located on the back left hand side of the machine. Make sure that the emergency stop button, located on the right hand side of the machine, is disengaged. To make sure that the emergency stop button is disengaged, push the button in towards the machine, to activate it, and then rotate the button 45deg clockwise, to deactivate it.



**F.** Turn the ULTRACODE machine ON.

## 2. Initial Operations

**A.** When the machine has been turned on, for a few seconds the display will show the internal software version and the machine model.



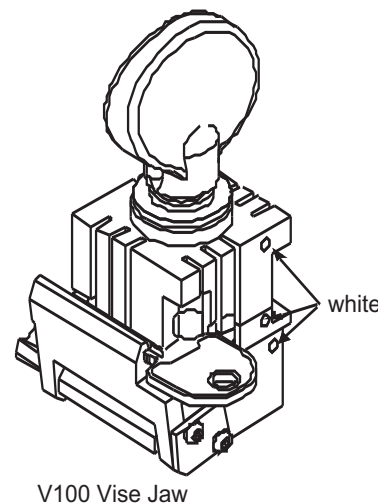
**B.** After a few seconds, the ULTRACODE's main menu will appear on the screen. Use the  $\uparrow$  &  $\downarrow$  buttons to move the cursor to the required option. Once the cursor is at the desired location, press the ENTER button or directly press the numbered button corresponding to the option number.

**C.** In order to successfully cut keys on the ULTRACODE machine, it is recommended that the operator calibrate the ULTRACODE before attempting to advance with any other functions.

## 3. Calibration

**A.** Use the  $\uparrow$  &  $\downarrow$  buttons to move the cursor to the CALIBRATIONS options, then press the ENTER button, or directly push the #4 button. This will open the CALIBRATIONS menu.

**B.** Select the JAWS option and press the ENTER button or directly push the #1 button.





**C.** Select the V100 STANDARD JAW from the menu screen and press the ENTER button. Before starting the vise jaw calibration, make sure that there are no keys and /or adaptors fitted in the V100 jaw.

**D.** The screen will show that Side A of the vise jaw is ready to be calibrated. Press the START button.

**E.** The screen will show the message, “Install Z1 & Z3 temp See operating manual”. Replace the ULTRACODE’s cutter with the Z1 template. To remove the cutter, follow the instructions on page 16, ch 4.6 “Changing the cutter”. Insert the Z3 template into the V100 vise jaw taking note of the jaw side that is shown on the machine’s display. Once the Z3 is in place, press the START button.

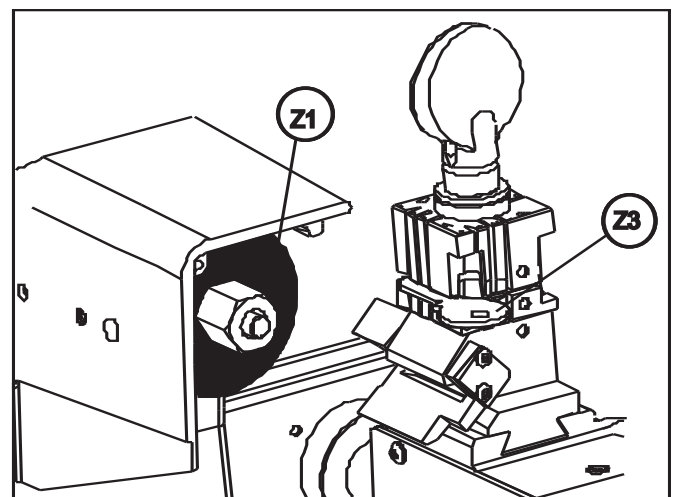
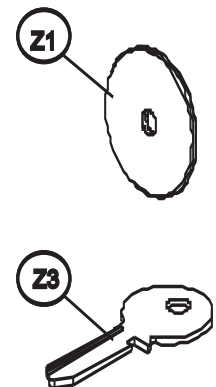
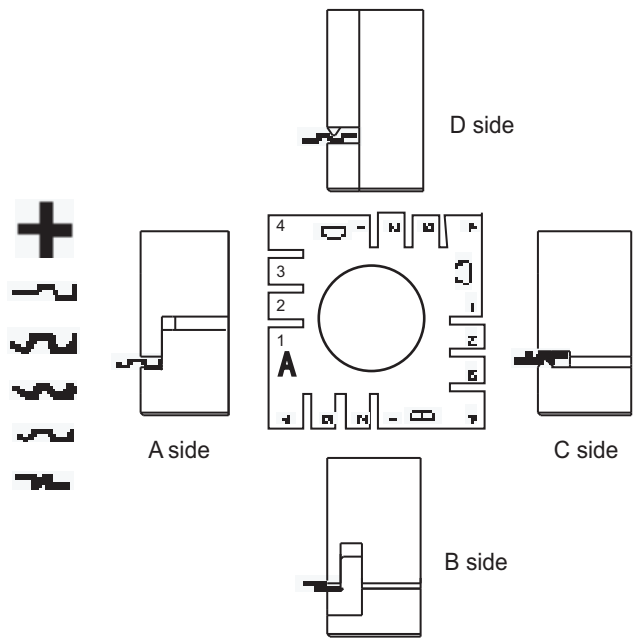
**F.** By pressing the START button, the ULTRACODE will automatically start the calibration of the V100 vise jaw by means of electric contact between the two templates.

**G.** Once the operation is complete, the screen will show the differences from the theoretical values. To save the data, press the ENTER button. At this point push the ENTER button. If the STOP button is pressed, the new settings will not be saved, and the previous settings will remain valid.

**H.** The settings will be accepted by the ULTRACODE only if the tolerances remain within a range between  $-11.8/+11.8$  thousandths of an inch.

**I.** The same procedure must be followed for all four sides (A, B, C, D) of the vise jaw.

**J.** After calibrating all sides of the V100 vise jaw, remove the Z1 template from the cutter shaft and replace it with the original cutter. Make sure that the cutter has the directional arrow facing outwards. Once the cutter has been installed, press the STOP button once. The screen will once again display the CALIBRATIONS menu.



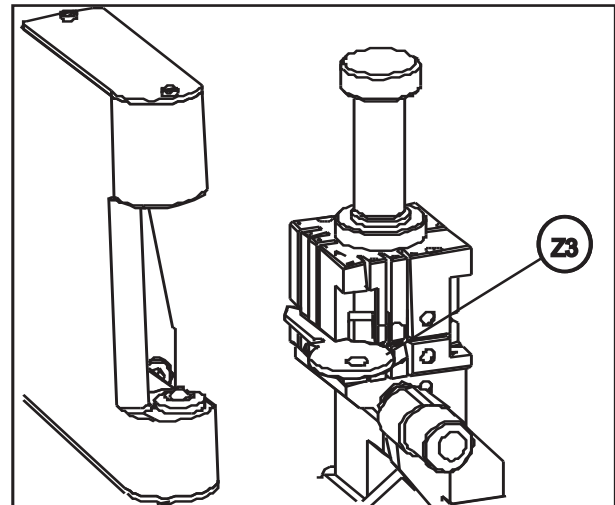


#### 4. Calibrating the Cutter

- A. Select the CUTTERS option from the CALIBRATIONS menu screen and press the ENTER button, or directly press the #2 button.
- B. Select the U01 cutter from the menu screen. Press the START button. The screen will then display the message, “Install the Z3 template. See operating manual”. It is recommended that the same Z3 template be used for calibrating the cutter and the jaw. Once the Z3 has been installed in the V100 jaw, press the START button.
- C. After the detection has taken place, the screen will display the differences from the theoretical values. Press the ENTER button to save the new data. The new data will only be accepted if the tolerance of the cutter’s diameter remains within a range between +39.3/-39.3 thousandths of an inch. Once this operation has been completed, the Z3 template must be discarded. When the cutter is calibrated, the Z3 key is marked, and cannot be used again.
- D. Press the STOP button twice to return to the ULTRACODE main menu.

#### 5. Calibrating the R100 Jaw (only if optical reader is installed)

- A. Use the ↑ & ↓ keys to move the cursor to the CALIBRATIONS option on the ULTRACODE’s main menu, and press ENTER, or directly push the #4 button. This will open the CALIBRATIONS menu.
- B. Select the JAWS option or the #1 option from the menu screen and press the ENTER button.
- C. Select the R100 jaw from the menu screen and press the ENTER button. Before starting the vise jaw calibration, make sure that there are no keys and /or adaptors fitted in the R100 jaw. Press the START button.
- D. Install the Z3 template into the R100 jaw on side A. Press the START button.
- E. After the detection has taken place, the screen will display the differences from the theoretical values. Press the ENTER button to save the new settings. These new settings will only be accepted if the tolerances remain within a range between -11.8/+11.8 thousandths of an inch.
- F. The same procedure must be followed for all four sides (A, B, C, D) of the vise jaw. Once all four sides of the R100 jaw have been calibrated, press the STOP button twice to return to the ULTRACODE’s main menu.



## 6. Cutting Keys Using the Optical Reader

**A.** Use the ↑ & ↓ buttons to move the cursor to the COPY FROM ORIGINAL option and press ENTER, or directly push the #0 button. This will open the COPY FROM ORIGINAL menu. This option will only be available on machines that have the optical reader installed.

**B.** Insert the original key into the R100 optical reader jaw. According to the type of key to be copied, establish which side of the jaw the key must be inserted in. Press either the A, B, C, or D buttons to tell the ULTRACODE which side of the vise jaw is being used. The desired letter will replace the question mark (?) on the screen.

**C.** The next line on the screen deals with the Key Gauge Stop. Use the ↓ button to scroll down to the Pos. line. By default the ULTRACODE will always show the (0) stop position. The (0) stop position should be used with all shoulder-gauged keys. If the original key does not have a shoulder, then enter the desired tip stop value. Press either the 1,2,3, or 4 buttons to select the desired tip stop position. The desired value will replace the (0) value on the screen.

**D.** Once the jaw side and the tip stop position have been selected, press the START button.

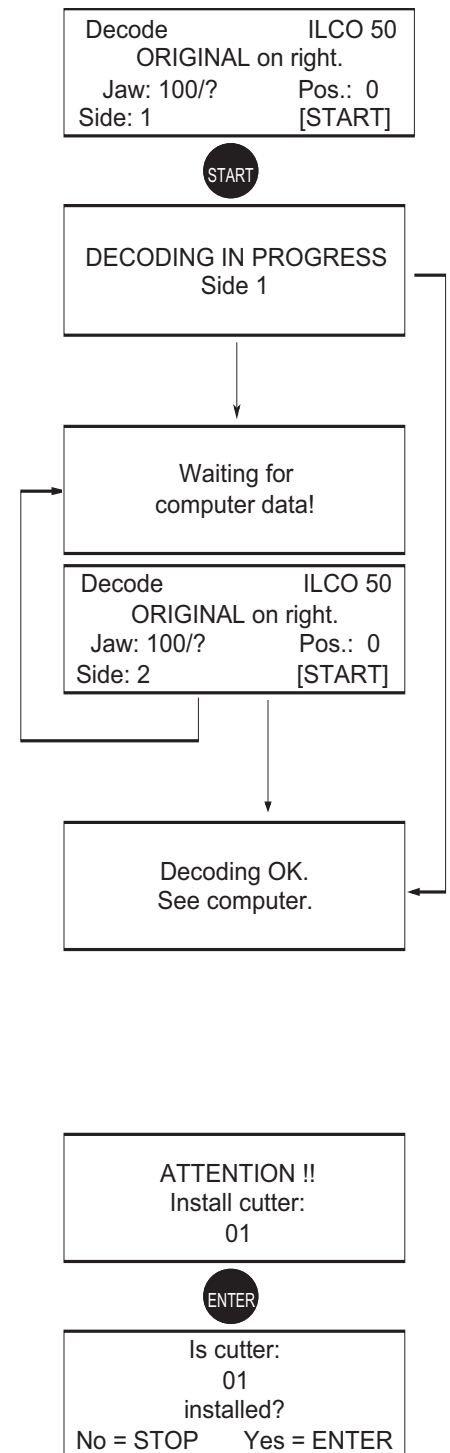
**E.** The screen will display the message “Reading in Progress”. Once the reading has taken place, the ULTRACODE will allow manual data alterations to take place. The operator may manually alter the depth and space parameters of the key that was just read. In most cases, this option will not apply to keys being cut on the ULTRACODE.

**F.** Press the START button.

**G.** Place the key to be cut in the V100 cutter side jaw. Use the same side and stop positions as the key that was fitted to the R100 optical reader side jaw. These values will already be shown on the screen, and will not have to be input by the operator. Press the START button.

**H.** If the key to be cut is present in the V100 jaw during the initial reading process, the key will be partially cut; it will be completed only at the end of the cutting process.

**I.** To return to the ULTRACODE’s main menu, push the STOP button until the menu screen appears.





## 7. Cutting Keys by Card

**A.** Use the ↑ & ↓ buttons to move the cursor to the CUT BY CARD option and press ENTER, or directly push the #2 button. This will open the CUT BY CARD menu.

**B.** A data card is a database of cutting “spaces”, “depths”, and “angles” for all of the keys in the ULTRACODE’s database. Use the ULTRACODE internal Card list to select the appropriate card number. Use the number and letter buttons, to type this card number onto the appropriate line, then press ENTER.

**C.** The screen will now display all the possible depths for that particular system. Using the number and letter buttons, enter the actual cut depths that are required for the key. Press the ENTER button.

**D.** The screen will display which side of the key is to be cut, which jaw is being used as well as which side of the jaw to use. The screen will also display which tip stop position to use, which cutter to use, and how many pieces are to be cut. Once all this information has been viewed and understood, press the START button.

**E.** When cutting keys, place the key to be cut in the jaw and push the START button. The key will then be cut. If cutting a double-sided key, turn the key over and place it back in the jaw. Once the key is back in the jaw, push the START button; the second side of the key will be cut.

**F.** To return to the ULTRACODE’s main menu, push the STOP button until the menu screen appears.

Enter card number:  
1 - ILCO = 567  
2 - HPC =  
3 - USER =

ENTER

Side 1 x 2 ILCO 567  
.....  
Possible depths:  
1234

ENTER

Side: 1  
Jaw.: 100/\* Pos. : 0  
Cutter: U01 STD  
Pieces = 2 [START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 1

Side: 2  
Jaw: 100/\* Pos. : 0  
Cutter: U01  
[START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 2

START

Copy: 2 of: 2  
finished.  
More copies?  
No = STOP Yes = ENTER

## 8. Cutting Keys by Code

**A.** Use the ↑ & ↓ buttons to move the cursor to the CUT BY CODE option and press ENTER, or directly push the #3 button. This will open the CUT BY CODE menu.

**B.** To search by code, use the number and letter buttons to enter the required code onto the appropriate line. Then press the ENTER button.

CONTINUED ON PAGE 8

## 8. Cutting Keys by Code CONTINUED

**C.** The screen will display the possible depths and the actual depths for the required code. Once this information has been viewed and understood, press the ENTER button.

**D.** The screen will display which side of the key is to be cut, which jaw is being used, as well as which side of the jaw to use. The screen will also display which tip stop position to use, which cutter to use, and how many pieces are to be cut. Once all this information has been viewed and understood, press the START button.

**E.** Once the first side of the key has been cut, turn the key over and place it in the jaw. Once the key is back in the jaw, push the START button. To search for a code by a Manufacturer name, use the number and letter buttons to enter the Manufacturer's name onto the appropriate line. Press the ENTER button to list all of the available data.

**F.** Use the ↑ & ↓ keys to move the cursor through the list of information. Once the required code has been found, press the ENTER button to select it. Follow steps C, D, and E, which appear directly above.

*It is our hope that this Quick Start Guide will enable you to quickly and efficiently set up, and begin using your new **ULTRACODE** key machine. For more detailed information, trouble shooting practices, common maintenance tips, and useful photos, please refer to your **ULTRACODE** owners' manual. We strongly advise you to keep both of these documents safe and readily available. They will prove very useful in the future. Should you require addition assistance or support, please feel free to contact the Ilco Technical Assistance Dept.*

**Ilco Technical Assistance Dept.  
400 Jeffreys Road  
Rocky Mount, NC 27804  
USA**

**Tel: 1800-ILCO-USA  
1-800-(452-6872)  
Ext: 200, 384, 356**

**Fax: 252-446-4702**

CODE: AA11  
MFG :  
=>  
(AA00-7T51 GM94+ GM)

ENTER

Side 1 x 2 ILCO 567  
1123321323  
Possible depths:  
1234

ENTER

Side: 1  
Jaw.: 100/\* Pos. : 0  
Cutter: U01  
Pieces = 2 [START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 1

Side: 2  
Jaw: 100/\* Pos. : 0  
Cutter: U01  
[START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 2

START

Copy: 2 of: 2  
finished.  
More copies?  
No = STOP Yes = ENTER





# ULTRACODE

KEY CUTTING MACHINE

Operating manual

D418562XA



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1st edition: November 2000

Printed in U.S.A.



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## REFERENCE GUIDE

This manual has been produced to serve as a guide for users of the ULTRACODE electronic key-cutting machine. Read it carefully; it is essential if you wish to operate your machine safely and effectively. Contact Ilco Unican Technical Assistance for further information at 1-800-ILCO-USA / 1-800-452-6872. Ext.: 200, 384, 356

### CONTENTS

The contents of the manual are divided into sections relating to:

- Machine description .....Chapter 1
- Transport and installation .....Chapters 2-3
- Calibration and use .....Chapters 4-5-6
- Maintenance .....Chapters 7-8-9

### TECHNICAL TERMS

Common technical terms are used in this manual.

To assist those with little experience of keys and key-cutting, below is an illustration of the terms most frequently used.

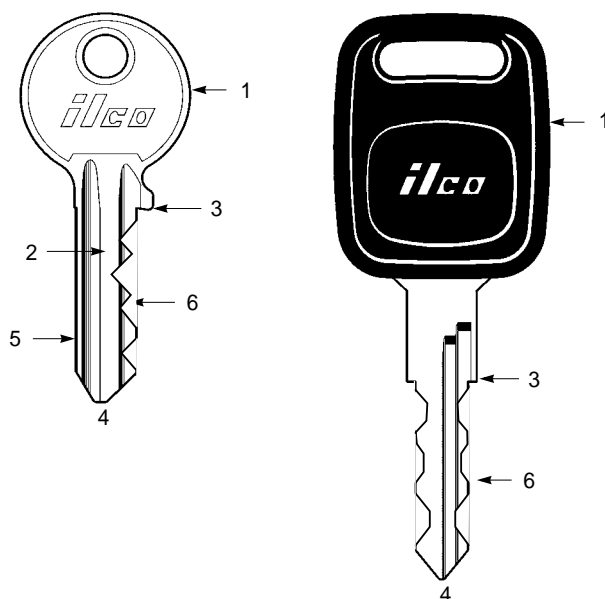


Fig. 1

- 1) Head
- 2) Blade
- 3) Shoulder
- 4) Tip
- 5) Back
- 6) Cuts



## GENERAL

### USE

The ULTRACODE is designed for cutting keys of non-ferrous materials: brass, nickel silver, etc.

It must be installed and used according to the instructions indicated by the manufacturer.

If the key-cutting machine is used differently or for purposes different from those described in this manual, the customer will forego any rights he may have over ILCO UNICAN CORP. Furthermore, unforeseen danger to the operator or any third parties may arise from incorrect use of the machine.

### INCORRECT USE

Improper use of this machine or failure of the operator to observe the instructions written in this manual will void all guarantees and responsibilities of the manufacturer.

It is therefore essential to carefully read and understand this operating manual.

### IMPROPER USE OF ELECTRIC CONTACT

CAUTION:

- it is not recommended to cut ULTRALITE™ anodized aluminium keys. It is also not recommended to cut plastic keys or any keys with materials that do not have electrical conductivity.

### MACHINE IDENTIFICATION

- The machine is provided with an identification label which includes the machine's serial number (fig. 2).

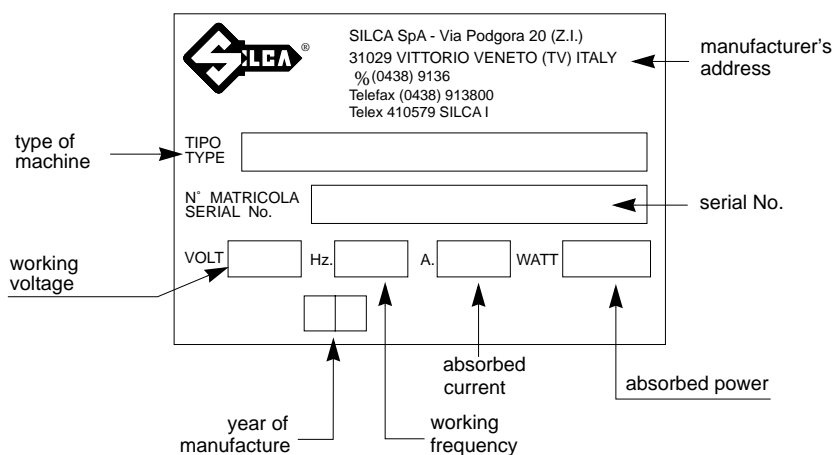


Fig. 2

# 1 MACHINE DESCRIPTION

The ULTRACODE is an electronic machine operating on two axes with controlled movement. The machine was designed to add a high degree of cutting precision to operating speed and ease of use. The ULTRACODE can be used in 2 different ways:

- entering the key code directly by means of the machine keyboard
- linking to a PC



Fig. 3

## 1.1 MAIN CHARACTERISTICS

- Movements

Movement of the two axes (X-Y) operates on ball screws activated by step motors, on rectified roller guides.

- Jaw

Standard four-sided vise jaw, specially designed to grip most commercial, automotive and residential keys.

- Cutter

Consists of a cutter in HSS (high speed steel), that is easily replaced.

Operator can adjust the cutter for the type of work and speed rotation needed.

An Optional carbide cutter is available.

- Display

Rear-illuminated and placed on the front of the machine.

Display with 4 rows of 20 characters each.

## 1.2 SAFETY

- Emergency stop

The red emergency button (N) (fig. 4, page 5) located on the right-hand side of the machine is used to stop the Ultracode immediately in the event of faulty operation or danger to the operator.

When the cause of the emergency has been eliminated, turn the button 45° clockwise to deactivate it. The button will "pop" out away from the machine when deactivated.

---

NOTE: the operator is responsible for keeping the area around the button clear so that it can be reached as quickly as possible.

---

- Cutter motor protection

The cutter motor is protected against overheating by a cut-out switch (located inside the motor). The motor will automatically shut down if it reaches a certain temperature.

If the switch activates:

- 1) turn the machine off and disconnect the power supply cable. Machine will reset after motor has cooled sufficiently.

If machine does not reset: contact Ilco Technical Assistance at 1-800-ILCO-USA  
1-800-334-1381/ 1-800-452-6872

- Protective shield (optional)

The transparent protective shield is designed to cover the working parts as completely as possible, ensuring operator safety.

### 1.3 MAIN WORKING PARTS

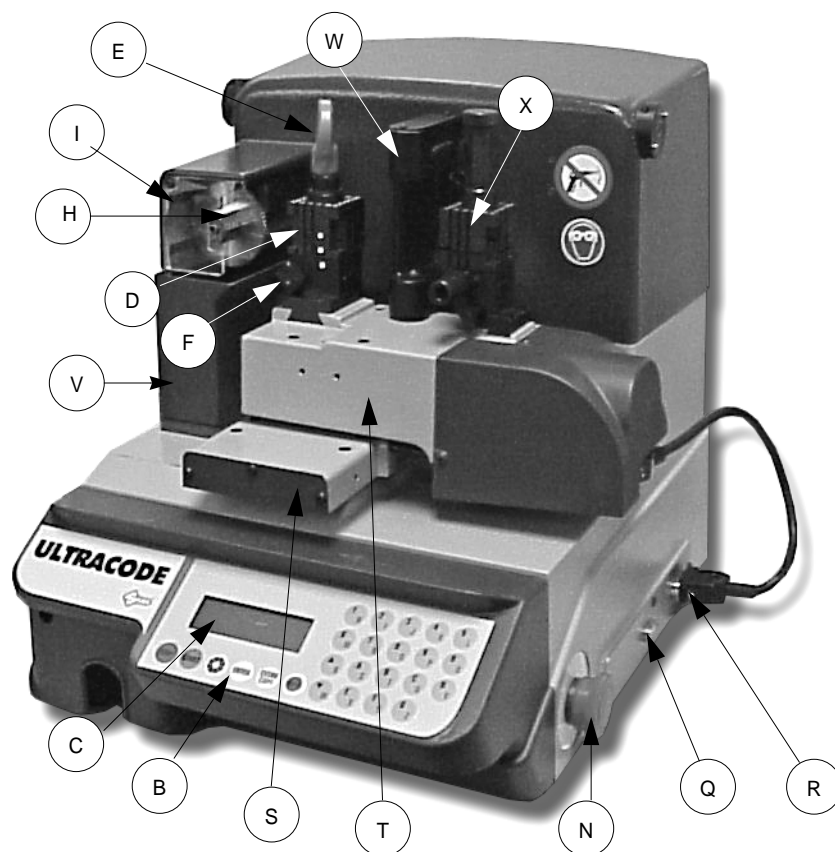


Fig. 4

- A - master switch
- B - keyboard
- C - display
- D - vise jaw (V100)
- E - clamp knob
- F - key gauge
- H - cutter
- I - cutter shield
- N - emergency button
- Q - serial port
- R - Y axis connector
- S - X axis carriage
- T - Y axis carriage
- V - chip tray
- W - optical reader
- X - reader vise jaw (R100)





## 1.4 TECHNICAL DATA

Electricity supply:

110V-60Hz (100V - 50/60Hz)

Maximum absorbed power:

110V: 3,6 Amp. 396 Watt

cutter motor:

one speed, single phase

cutter:

HSS (high speed steel) - optional hard metal carbide cutter - Part No. D405933ZZ

Tool speed:

- 60Hz: 1100 rpm (+/- 10%)

with pulleys inverted:

- 60Hz: 2700 rpm (+/- 10%)

Movement:

on 2 axes with ball screws activated by step motors, on rectified roller guides.

Jaw:

universal 4 sided vise jaw to grip flat, commercial, residential and automotive keys

Runs:

X axis: 2.24 " Y axis: 1.26 "

Dimensions:

width: 19.69 " depth: 19.69 " height: 16.54 " (with raised shield 25.59 ")

Mass:




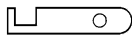

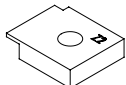
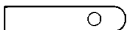
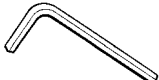
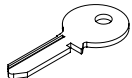


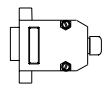
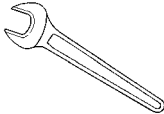

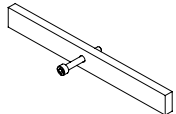
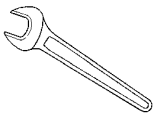







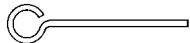



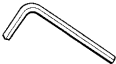

81.4 lbs • 37 kg

Noise level:

sound pressure Lp(A) = 85 dB(A) (cutting steel keys)

## 1.5 ACCESSORIES PROVIDED

The ULTRACODE comes with a set of accessories for its operation and maintenance (tools, hex wrenches, fuses) supplied in a special tool kit comprising:

tool kit 	0.157 " allen key D300224ZZ 	Z1 template (regulating disk) D416657BA 
Tip stop with notch D402301BA 	0.196 " allen key D300225ZZ 	Z2 template (regulating block) D416660BA 
Tip stop D402302BA 	0.236 " allen key D300226ZZ 	Z3 template (regulating key) D416658LR 
Cutter release rod D400754BA 	2 Amp fuse – delayed D312423ZZ 	Z4 serial test connector D416661ZZ 
0.511" spanner D302788ZZ 	4 Amp fuse – rapid D301185ZZ 	Belt tension plate D416552BA D202443ZZ 
0.39 " spanner D300308ZZ 	10 Amp fuse - delayed D316568ZZ 	Anti-tilting device D508699ZZ 
0.059 " allen key D302434ZZ 	4 Amp fuse - delayed D308726ZZ 	Slanted brush D306935ZZ 
0.0787 " allen key D300221ZZ 	6.3 Amp fuse - delayed D310652ZZ 	ø 0.0669 " steel pin D401225ZZ 
0.0984 " allen key D300222ZZ 	0.748 " socket wrench D306963ZZ 	ø 0.0472 " steel pin D401224ZZ 
0.118 " allen key D300223ZZ 	WIN-TRANSFER program disk 	

## 2 TRANSPORT

The key-cutting machine is easily transported and is not dangerous to handle.  
The packed machine should be carried by at least two people.

### 2.1 PACKING

The packing for ULTRACODE is designed to ensure safe transportation and to protect the machine and all its parts.

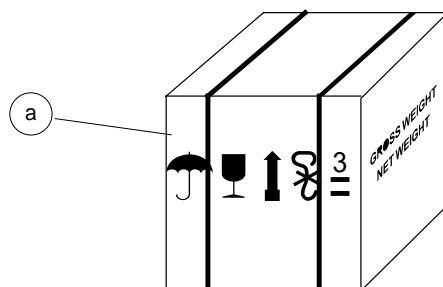


Fig. 5



To prevent any damage to the machine it is advisable to save the box for future transportation.

## 2.2 UNPACKING

After removing the machine from the packing box, check the contents in the box, which should comprise the following :

- 1 ULTRACODE key-cutting machine
- 1 set of documents, including: an operating manual, a spare parts list and a \*warranty card
- 1 power supply cable
- 1 tool kit

NOTE: we strongly recommend you keep the packing intact for future transportation.

## 2.3 MACHINE HANDLING

When the ULTRACODE has been unpacked, place it directly on its workbench; this operation should be carried out by at least two people.

Carefully lift the machine firmly holding the base, and no other part. Do not drag the machine, the feet will be bent and damaged.

ATTENTION: never lift the machine by holding the keyboard stand (fig. 6).



INCORRECT!



CORRECT!

Fig. 6

- \*Warranty Card should be filled out and returned to Ilco Unican for tracking purposes.



### 3 MACHINE INSTALLATION AND PREPARATION

The key-cutting machine can be installed by the machine owner and does not require any special skills. It is supplied ready for use and does not need any special set up. ( However, it is recommended that the operator follows the calibration procedure before operating the machine.)

#### 3.1 CHECKING FOR DAMAGE

The ULTRACODE is solid and compact and will not normally damage if transport, unpacking and installation have all been carried out according to the instructions in this manual. However, it is always advisable to check that the machine has not suffered any damage.

#### 3.2 ENVIRONMENTAL CONDITIONS

To ensure that the best use is made of the key-cutting machine, it is important to place it in a well-aired area which is not too damp.

The ideal conditions for the machine are:

temperature between 10°C (50°F) to 40°C (104°F) relative humidity: approx. 60%.

#### 3.3 POSITIONING AND INSTALLATION

- 1) Place the machine on a horizontal surface, solid enough to support the weight of 75,9 lbs.
  - to work with ease, we suggest that the workbench be approximately the height of the operator's hip.
  - it is important to leave clearance of at least 12" behind the machine and on each side to ensure proper ventilation.
- 2) Ensure that the machines voltage is the same as that of the mains power supply, which must be properly grounded and provided with a differential switch.
  - connect the power supply cable to the power supply socket.

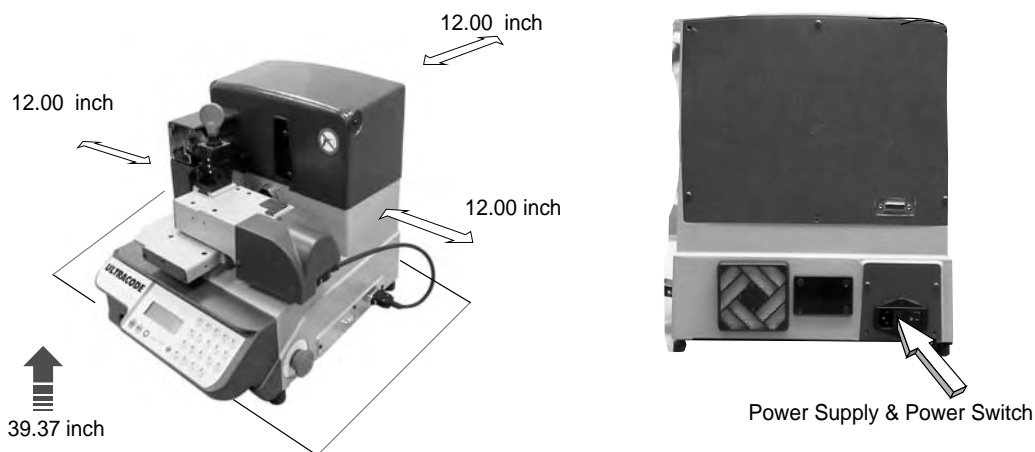


Fig. 7

### 3.4 DESCRIPTION OF WORK STATION

The machine needs only one operator, who has the following controls at his/her disposal (fig. 4, page 5):

- master switch located on the back of the machine
- vise jaw
- keyboard
- display
- emergency button

### 3.5 GRAPHICS

- The machine carries an adhesive warning label (fig. 8). These labels must never be removed.



Do not use compressed air  
for cleaning



The use of protective  
goggles is recommended

Fig. 8

## 4 “SET UP” AND USE OF THE MACHINE

### 4.1 KEYBOARD AND FUNCTIONS

The machine's keyboard has 19 alphanumeric and 6 function keys.

The alphanumeric keys are used for entering the data card number and the cutting data (numbers and/or letters) according to the code on the card in use.

Each of the 19 alphanumeric keys contains two characters: the main character (black) which is directly active, and an alternate character (red), which can be activated by simultaneously pressing the SHIFT key.

E.g.: pressed directly produces: 1

+ Pressed simultaneously produce: H

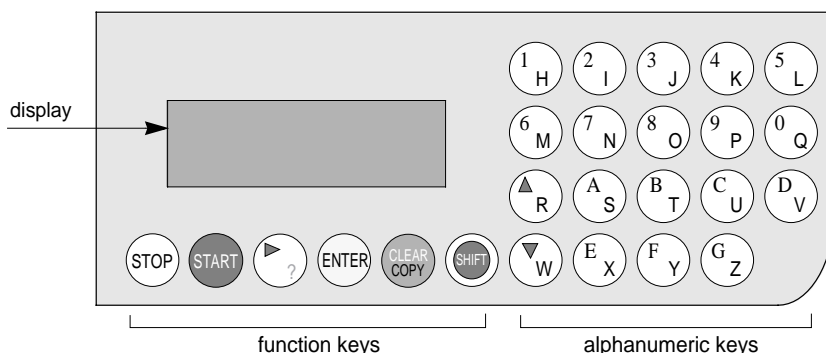


Fig. 9

#### FUNCTION KEYS



Stop button, used particularly when the machine is in motion.  
Stops the function in progress at any time in the operation.



Starts the machines operations



Returns cursor to the last operation.



Activation of various functions in the menu.



CLEAR: deletes numerical characters.



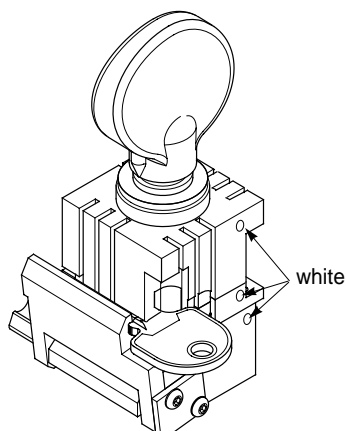
Pressed in combination with all the keys of the same color to enter the number or letter available.

- regulating the display

It is possible to adjust the angle of vision on the machine's display by following the instructions described below:

- To incline the angle of the display towards the bottom you must press the ▼ key and then press the ▲ key, simultaneously keeping them both pressed ▼▲ up until you reach the desired angle for viewing..
- to incline the visualization of the display towards the top you must press the ▲ key and then press the ▼ key, simultaneously keeping them both pressed ▲▼ up until you reach the desired angle for viewing.

## 4.2 USE OF THE VISE JAW



V100 Vise Jaw

Fig. 10

The four-sided vise jaw ensures an excellent grip on the keys placed on their back or profile sides (fig. 11).

- Single Sided Keys cut by code should be positioned mainly on the A and/or B side of the clamp.
- For keys to be cut by code the side of the vise jaw on which to place the key is shown on the machines display.
- To fit keys with tip stops, place the tip stop bar provided into the special grooves (fig. 12).

Fig. 11

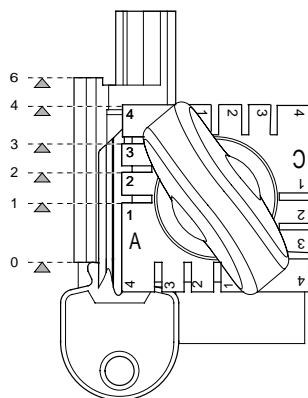
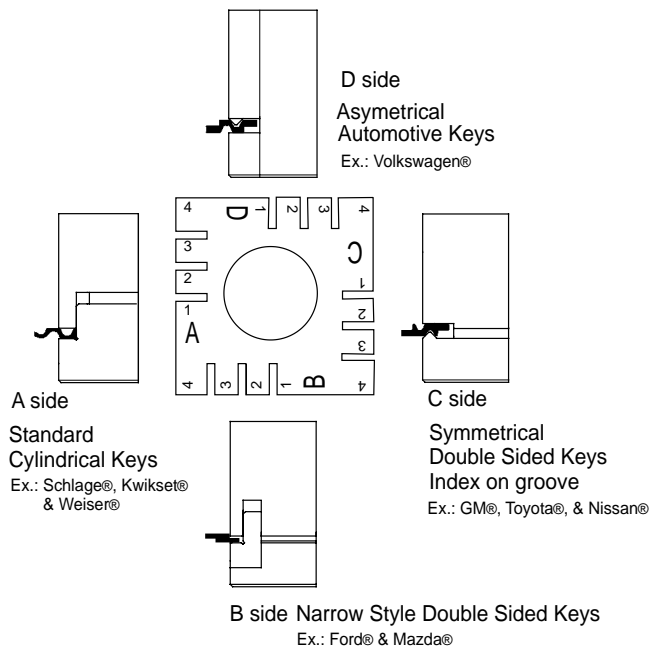
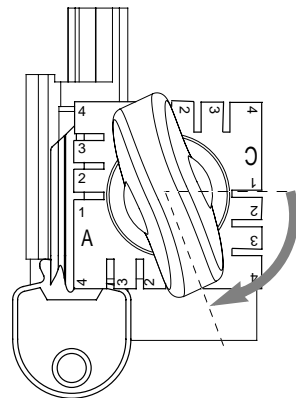


Fig. 12 - key stops



**ATTENTION:** when closing the vise jaw, do not apply excessive pressure to the knob. Turning the knob approximately  $70^\circ$  (equal to a force of  $3\text{Nm}$ ) is sufficient to secure the key (fig. 13).

Fig. 13



**NOTE:** before starting the cutting process the V100 vise jaw key gauge will automatically fall to its rest position.

### ***USING THE PINS***

For keys with narrow blades the pins must be placed between the bottom of the vise jaw and the back of the key so that the key protrudes sufficiently out of the clamp and therefore can be properly cut.

If the key has a narrow blade and is also very thin, 2 pins must be used (see fig. 14).

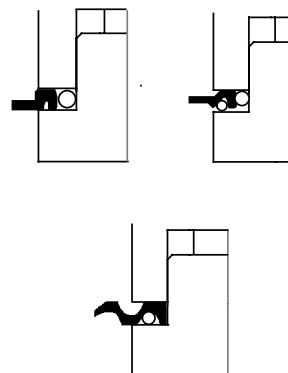


Fig. 14

### 4.3 CUTTING BY ELECTRIC CONTACT

The ULTRACODE key-cutting machine is equipped with a low voltage electrical contact device which permits the cutter to measure the key blank width as it approaches the cutter during the cutting phase (fig. 15).

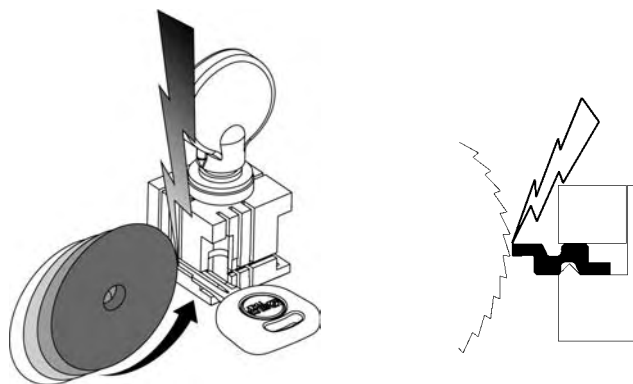


Fig. 15

This exclusive feature permits the operator to secure the key to the most appropriate side of the 4 faced vise jaw (A, B, C or D) therefore improving the grip on the key and eliminating the need for pins and/or adaptors.

With the electrical contact feature, depth calibration is automatically calculated when the cutter touches the keys profile during the cutting process.

Electrical contact is guaranteed for keys in steel, brass, nickel silver, Zamak or iron (with or without nickel-plating).

Improper use of electric contact

- it is not recommended to cut ultralite anodized aluminium keys. It is also not recommended to cut plastic keys or any keys with material that does not have electrical conductivity by means of electric contact. Attention: for these types of materials, use standard cutting.
- cuts cannot be repeated on the same side of the key when electric contact cutting is used.

All data cards provided by ILCO are in the machine's memory. The cards are enabled or disabled for code cutting by electric contact at ILCO's discretion.

The data cards are divided into 3 types which are distinguished by special symbols shown on the display (asterisk "\*" and "+" ).

- 1) Vise Jaw: 100/A    START
  - data card with standard cutting (press START)
- 2) Vise Jaw: 100/B    START+
  - data card with standard cutting (press START)
  - alternative: electric contact cutting press SHIFT+START
- 3) Vise Jaw: 100/\*    START+
  - data card with electric contact cutting (press START)
  - alternative: standard cutting press SHIFT+START

Side - 1	
Jaw: 100/A	Pos.: 0
Cutter: U01	Adapt.: 0
Pieces = 3	[START]

Side - 1	
Jaw: 100/B	Pos.: 0
Cutter: U01	Adapt.: 0
Pieces = 3	[START] +

Side - 1	
Jaw : 100/*	Pos.: 0
Cutter: U01	Adapt.: 0
Pieces = 3	[START] +

A - B: indicate the side of the vise jaw

+ : indicates the alternative activated with the SHIFT+START keys

\* : indicates that the key can be clamped to any side of the vise jaw when the data card is enabled for electric contact.

**Operating keys:**

SHIFT+START: changes the cutting procedure ('standard' or 'by electric contact') and starts cutting.

START: begins the cutting process.

**ATTENTION:** the alternative selected with the SHIFT+START keys ('standard' or 'by electric contact') is maintained as long as the chosen data card is in use. When the procedure has been selected, simply press START for successive cutting operations.

#### 4.4 FITTING THE VISE JAW TO THE MACHINE

To remove the vise jaw unit:

- loosen the grub screw (D2) (fig. 16) and slide the vise jaw out of the dovetail guide.

To install the vise jaw unit on the machine:

- slide the vise jaw into the dovetail guide, pushing it all the way in, then secure it by tightening the grub screw (D2).

These instructions refer exclusively to the standard vise jaw (V100). For the use of optional jaws please refer to the instructions provided along with them.

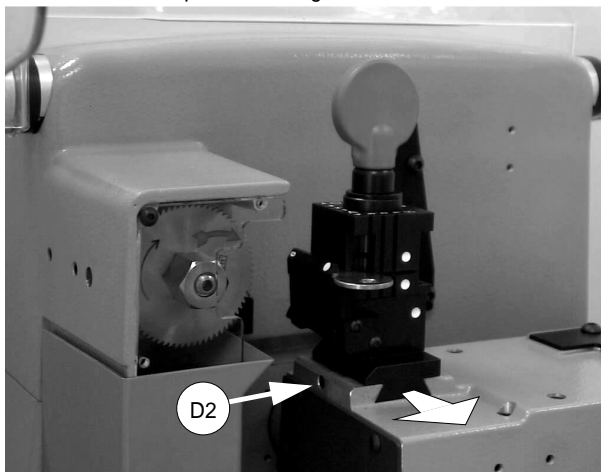


Fig. 16

#### 4.5 CUTTER

The majority of keys utilize the standard cutter (U01) for code cutting. In certain cases, special keys with particular type cuts will require different cutters.

To change the cutter see chapter 4.6.

#### 4.6 CHANGING THE CUTTER

- 1) remove the cutter protective shield (1) by loosening the screw (1a).
- 2) slide the cutter release rod (2) into the hole located on the left side of the machines cutter shaft chassis (fig. 17).
- 3) loosen the cutter locking nut (4) by turning it clockwise with the 19 mm socket wrench (3) provided with the machine.

ATTENTION: the thread is left-handed. (reversed)

- 4) replace the cutter, then tighten the nut (4) by turning it counter-clockwise and remove the rod from its hole.
- 5) place the cutters protective shield (1) back into position securing it with the screw (1a).

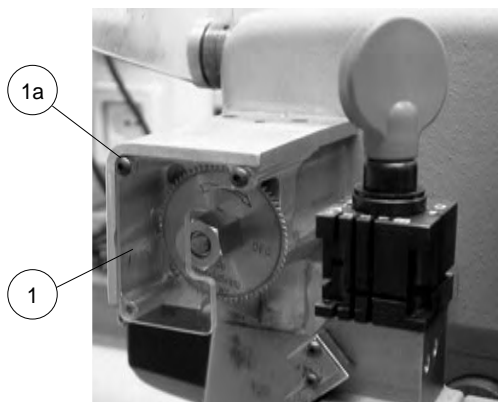
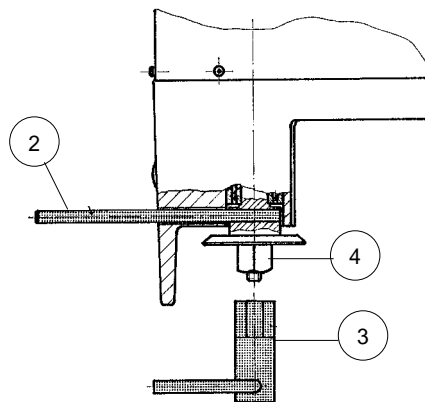


Fig. 17



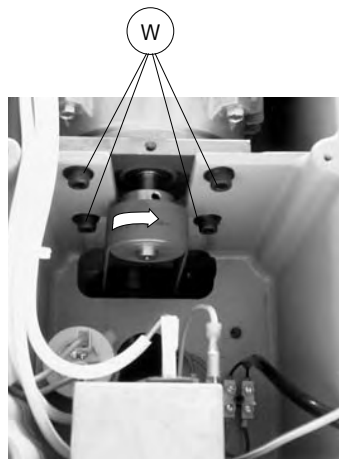
WARNING: when replacing a worn cutter with a new one or with a re-sharpened cutter consult Ch.5.6.3 "Calibrating cutters", page 35.

## 4.7 INVERTING THE PULLEYS

This operation must be carried out when the operator intends to use a carbide cutter (optional), in order to adapt the cutter speed to the newcutter's material.



Fig. 18



- 1) turn the machine off and disconnect the power supply cable.
- 2) remove the back and bottom metal panel (ch.7.8 and ch.7.9, page 56).
- 3) loosen the 4 motor locking screws (W) (fig. 18) and remove the belt.
- 4) loosen the 2 grub screws securing the pulley and remove it from the motor shaft.
- 5) fit the cutter shaft locking rod and use the allen key provided to loosen the screw (A1) and grub screws (A2) on the pulley (fig. 19).
- 6) invert the pulleys and secure them by tightening the grub screws, fit the screw and washer on the cutter shaft.
- 7) remount the belt and adjust its tension (ch. 7.4, page 52).
- 8) remount the back and bottom metal panel.
- 9) enter the 'cutter material' function in Ch.5.8 "Options [6]", page 42, and alter the speed.

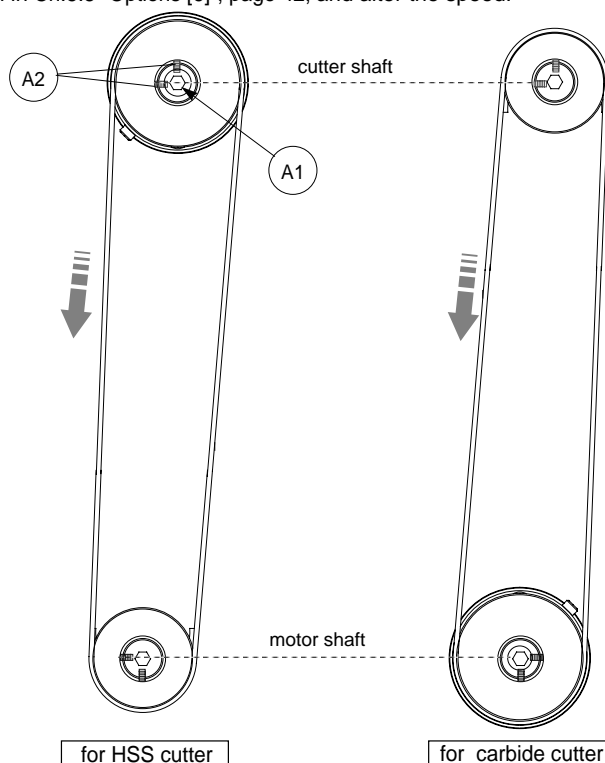


Fig. 19



## 5 OPERATING GUIDE

### Introduction

The Operating Guide below explains how to use the ULTRACODE without a Personal Computer. All operations to manually use the key-cutting machine are explained step by step. The programs available for Personal Computers connected to the key-cutting machine are able to transmit data for cutting.

Programs for Personal Computers eliminate manual procedures of certain functions. Once the data has been transmitted to the machine it bypasses some of the operating guide screens. When the ULTRACODE is used with a Personal Computer, the operating guide does not change its display logic, except for screens that are rendered unnecessary.

### 5.1 INITIAL OPERATIONS

When the key-cutting machine has been placed on its workbench and connected to a power source (Ch.3.3, page 10), proceed as follows:

- 1) make sure that the emergency button is not turned on.
- 2) turn the machine on by means of the main switch that is located on the back of the machine.
- 3) to check or alter the parameters for use of the machine, consult the "Options [6]" menu (ch.5.8, page 42).

When the machine is turned on, for a few seconds the display shows the internal software version and the machine model:

ULTRACODE  
version 1.0.0

### MAIN MENU

#### Operational keys:

use the ▼▲ keys to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

The >> symbol indicates that the menu contains other items which can be reached with the arrow key ▼.

0 - Copy from original \*  
1 - Cut by card  
2 - Cut by code  
3 - Queue from PC >>

\* APPEAR ONLY WHEN AN OPTIONAL  
OPTICAL READER IS INSTALLED &  
ACTIVATED

4 - Calibrations  
5 - Maintenance  
6 - Options >>

## 5.2 [0] COPY FROM AN ORIGINAL

ONLY- WITH THE OPTICAL READER -(OPTIONAL)

- 1) select the function.

### Operational keys:

use the arrow keys  $\nabla$   $\blacktriangle$  to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

- 2) insert the original key into the R100 optical reader side jaw.

### Jaw = R100/?

According to the type of key to be copied, establish which side of the jaw the key must be inserted. Enter '?' (A, B, C or D) in the jaw sides field (Ch.4.2, page 13).

### Pos. = 0

Key gauge stop; by default the program always shows the '0' stop (Ch.4.2, page 13).

For keys without a shoulder stop, enter the tip stop position (1, 2, 3, 4).

### Dist.= 000

To be used only for keys without a shoulder stop (from 0 to 0.393 inch).

To insert the "Dist." (distance) you must first enter the "Pos." (stop position) from 1 to 4.

The entered "Pos." (stop position) cannot be stop "0" ("Pos." must be 1, 2, 3 or 4).

Example: with tip stop '2' the cuts must start to be read at least 2 mm/.079" before the normal starting position (stop "0").

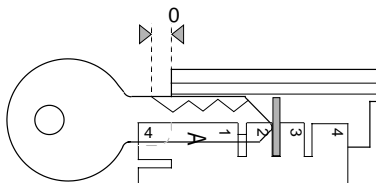


Fig. 20

### Operational keys:

numerical keys to enter the distance in the "Dist." field.

SHIFT+ arrow key  $\nabla$  : chooses the jaw from those available for the reading unit (with 'R' prefix); the jaw sides and stop are automatically set up. **Important:** the last reading jaw setting remains until another one is selected.

- 3) Place the key to be cut in the 'V100' cutter side jaw.

ATTENTION: use the same side and stop position as the key fitted to the R100 optical reader side jaw.

- during the reading process the key is partially cut; it will be completed only at the end of the reading process.

0 - Copy from original  
1 - Cut by card  
2 - Cut by code  
3 - Queue from PC

ENTER

Original on right

Jaw=R100/\_? (ABCD)  
Pos. = 0 (0-4)  
Dist. = 000 [START]

START

READING IN PROGRESS

- Data alteration

The operator may alter the 'depth' and 'space' parameters.

**Operational keys:**

to increase or decrease the parameters use a combination of the SHIFT + ▲ or SHIFT + ▼.

**Depth: (from -38.9 to +38.9 thousandths of a inch.)**

Enter the figure (positive or negative) to raise or lower all the cuts.

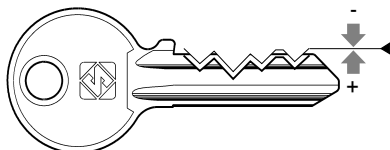


Fig. 21: depth adjustments

**Spaces: (from -38.9 to +38.9 thousandths of a inch)**

Enter the figure (positive or negative) to move all the cuts closer to or farther from the key stop.

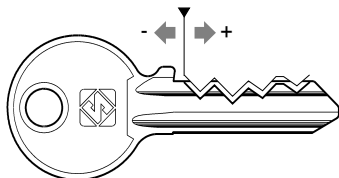


Fig. 22: spaces adjustments

**Pieces:**

enter the number required.

- 4) Carry out the same procedure to cut the remaining keys.

Adjustments ?

Depth = +00

Spaces = +00

[START]

Example:

Adjustments ?

Depth = -0,03

Spaces = -0,02

[START]

START

Key blank on left

Jaw= 100/A (ABCD)

Pos.: = 0 Dist.: -000

Pieces = 3 [START]

START

CUTTING IN PROGRESS

Copy: 1 of: 3

Copy :1 of: 3

Finished.

More copies?

No = STOP Yes = ENTER

### 5.3 [1] CUT BY CARD

One part of the machine's memory is used for the data cards.

A data card is a database of cutting spaces, depths and angles for all the keys in the machines data base.

The number of data cards is increased periodically when the ULTRACODE is updated. The updates are easily installed to a P.C. then transmitted over to the machine.

#### **ILCO data card ( 1 ):**

This option allows you to enter an Ilco Card Number (Example: 567 GM). This data card comprises the 'spaces and depths' database as described in the introduction to Ch.5 "OPERATING GUIDE", page 18).

The source of this information can be the ILCO Card listing, catalogues and other available documents.

#### **HPC data card ( 2 ):**

This option allows you to enter an HPC equivalent card (Example: CF215 GM).

#### **USER data card ( 3 ):**

This option is a user defined card.

### DESIGN A KEY FEATURE

See Supplement to accompany the Update Disk.

1) Press ENTER

#### **Vise Jaw: V100/\***

The special symbol (asterisk) means that the cuts will be made by electric contact (Ch.4.3, page 15) therefore it is unnecessary to select the vise jaw side.

#### **Pos.: 0**

Place the key to be cut into the V100 vise jaw using the stop that is shown.

#### **Cutter: U01**

Recommended cutter.

#### **Pieces:**

enter the quantity of keys to be cut.

2) proceed with cutting the first side by pressing the START key.

3) turn the key over and cut the second side.

#### **Operating keys:**

SHIFT+START: changes the cutting procedure ('standard' or 'by electric contact') and starts cutting.

START: begins the cutting operation.

SHIFT+ arrow key ▼ selects the side of the key to be cut.

- when the last side of the last key has been cut, the screen shows:

Enter card number:  
1 - ILCO = 567  
2 - HPC =  
3 - USER =

ENTER

Side 1 x 2                      ILCO 567  
.....  
Possible depths:  
1234

ENTER

Side: 1  
Jaw.: 100/\*                      Pos. : 0  
Cutter: U01 STD  
Pieces = 2                      [START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 1

Side: 2  
Jaw: 100/\*                      Pos. : 0  
Cutter: U01  
[START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 2

START

Copy: 2 of: 2  
finished.  
More copies?  
No = STOP    Yes = ENTER

## 5.3.1 SPECIAL CASES

- Cutting a key with two asymmetrical sides

**Operational keys:**

use the ▼▲ arrow keys to be able to visualize both sides of the keys possible cuts on the machines display.

Enter card number

1 - ILCO = 115

2 - HPC =

3 - USER =

ENTER

Side 1

ILCO 115

.....

Possible depths:

4321

1112213331

ENTER

Side 2

ILCO 115

.....

Possible depths:

4321

1121123313

ENTER

Side: 1

Jaw : 100/A

Pos. : 0

Cutter: U01 STD

Pieces = 1

[START]

Proceed with the cutting process.

- Impossible cutting combination

When the machine is used manually with certain data cards, it may not be possible to carry out certain entered combinations. This happens when the cutting depths are not compatible in the order the user entered the possible cuts.

Example:

Enter card number

1 - ILCO = 174

2 - HPC =

3 - USER =

ENTER

Side 1

ILCO 174

.....

Possible depths:

012345678

08213

ENTER

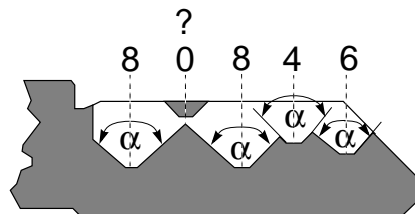
non-feasible  
combination!

The reason for the conflict between certain cuts is explained simply in the case shown.

With regard to the cut that originated the message <non-feasible function> it can be seen that between the two deep cuts (8) and the constant angle (100°) the intermediate cut (0) would be removed.

This happens when the cutting angle N (Normal) is not made variable by means of the type of cut L (Laser) (page 24).

Fig. 23

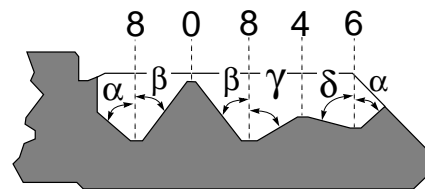


The new drawing is an example of how with the same cuts (80846), the cutting angles are automatically calculated by the conjunction of the cutting base with a straight line.

This aspect, admissible with certain car keys, is more commonly known as 'the ideal cutting line'.

**ATTENTION:** in this example it can be seen that the  $\beta$  angle is less than 45°. This could cause serious problems with a lock, making it difficult or impossible to place the key into the cylinder or remove it.

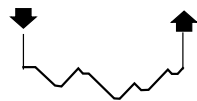
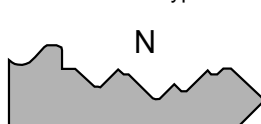
Fig. 24



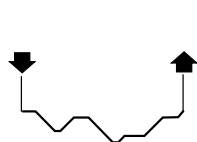
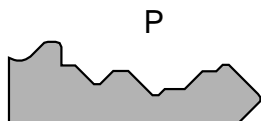


- Types of cut

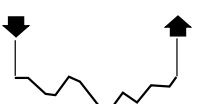
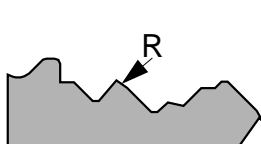
All the data cards provided by Silca have the type of cut pre-set according to the original parameters. The types of cut possible with ULTRACODE are: Radius, Normal, Flat, Laser and Vertical.

**NORMAL**

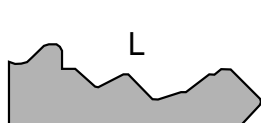
For conventional car and door keys.

**FLAT**

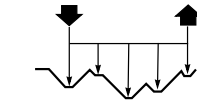
Mainly used for car keys where the cut edges are rounded to facilitate the movement of the blades when the key is put into the lock.

**RADIUS**

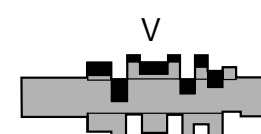
This type of cut eliminates flats and creates a radius at the bottom of each cut.

**LASER**

Cuts with variable angles can be obtained, peaks are eliminated, giving the advantage of key copies that slide perfectly into the lock.

**VERTICAL**

Primarily used for flat steel or safety deposit keys.

**EXAMPLE OF HOW TO CHANGE THE TYPE OF CUT:**

All the technical data regarding the types of cuts stored in the machine's memory can be changed according to the user's requirements.

- 1) enter data card number (e.g.: nr.567)
- 2) before entering the cuts press the combination of keys SHIFT+ENTER.
- 3) enter the "L" type cut by pressing the SHIFT+L keys to set the laser type cut.  
- the letter in brackets (L) indicates the type of cut recommended by Ilco.

NOTE: for certain cutting methods the standard cutter U01 must be replaced with a specific cutter (Ch.4.6 "Changing the cutter", page 16).

- 4) enter the combination and proceed with the operations described in ch.5.3, page 21.

Enter card number:

- 1 - ILCO = 567
- 2 - HPC =
- 3 - USER =

ENTER

Side 1 x 2 ILCO 567

.....  
Possible depths:  
1234

SHIFT + ENTER

ILCO 567

Cutter: U01  
Cut type (L) = L  
Alternative : N P

ENTER

Side 1 x 2 ILCO 567

112233  
Possible depths:  
1234

- Changing the cutter/adaptor/jaw

Some of the data cards stored in the machine's memory require a different cutter / adaptor / jaw from the standard or the previous installed.

EXAMPLE :

Enter card number:  
1 - ILCO =  
2 - HPC =  
3 - USER =

ENTER

Side 1            ILCO  
.....  
Possible depths:

and / or

ENTER

ATTENTION !!  
Install cutter:  
#

ENTER

Is cutter:  
#  
installed?  
No = STOP    Yes = Enter

and / or

ENTER

ATTENTION !!  
Install Jaw:  
#

ENTER

Is Jaw:  
#  
installed?  
No = STOP    Yes =Enter

and / or

ENTER

ATTENTION !!  
Install adaptor:  
#

ENTER

Is adaptor:  
#  
installed?  
No = STOP    Yes =Enter

## 5.4 [2] CUT BY CODE

### a) SEARCH BY CODE

CODE: AA11  
MFG :  
=>  
(AA00-7T51 GM94+ GM)

ENTER

Side 1 x 2      ILCO 567  
1123321323  
Possible depths:  
1234

ENTER

Side: 1  
Jaw.: 100/\*      Pos. : 0  
Cutter: U01  
Pieces = 2      [START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 1

Side: 2  
Jaw: 100/\*      Pos. : 0  
Cutter: U01  
[START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 2

START

Copy: 2 of: 2  
finished.  
More copies?  
No = STOP    Yes = ENTER

## b) SEARCH BY MANUFACTURER

Use the arrow ▼ to move the cursor to the following manufacturer.

CODE :  
MFG : G  
=> GM  
(4) LIST [ENTER]

ENTER

=> GM  
01 :AA00-7T51 GM94+  
02 :H1-H3988BGM2000  
03 : O1-O6999 GM 2000

ENTER

Side 1 x 2 ILCO 567  
  
Possible depths:  
1234

ENTER

Side: 1  
Jaw.: 100/\* Pos. : 0  
Cutter: U01 STD  
Pieces = 2 [START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 1

Side: 2  
Jaw: 100/\* Pos. : 0  
Cutter: U01 STD  
[START]+

START

CUTTING IN PROGRESS  
Copy: 1 of: 2  
Side 2

START

Copy: 2 of: 2  
finished.  
More copies?  
No = STOP Yes = ENTER

## 5.5 USE OF THE MACHINE WITH A PERSONAL COMPUTER

In the previous pages, the ULTRACODE key-cutting machine operational instructions have been presented from the point of view of manual use, i.e. operating from the keyboard incorporated in the machine to cut keys by code.

The information transmitted by the Personal Computer cannot be altered manually. Each line transmitted corresponds to a stage in the cutting process for one or more keys.

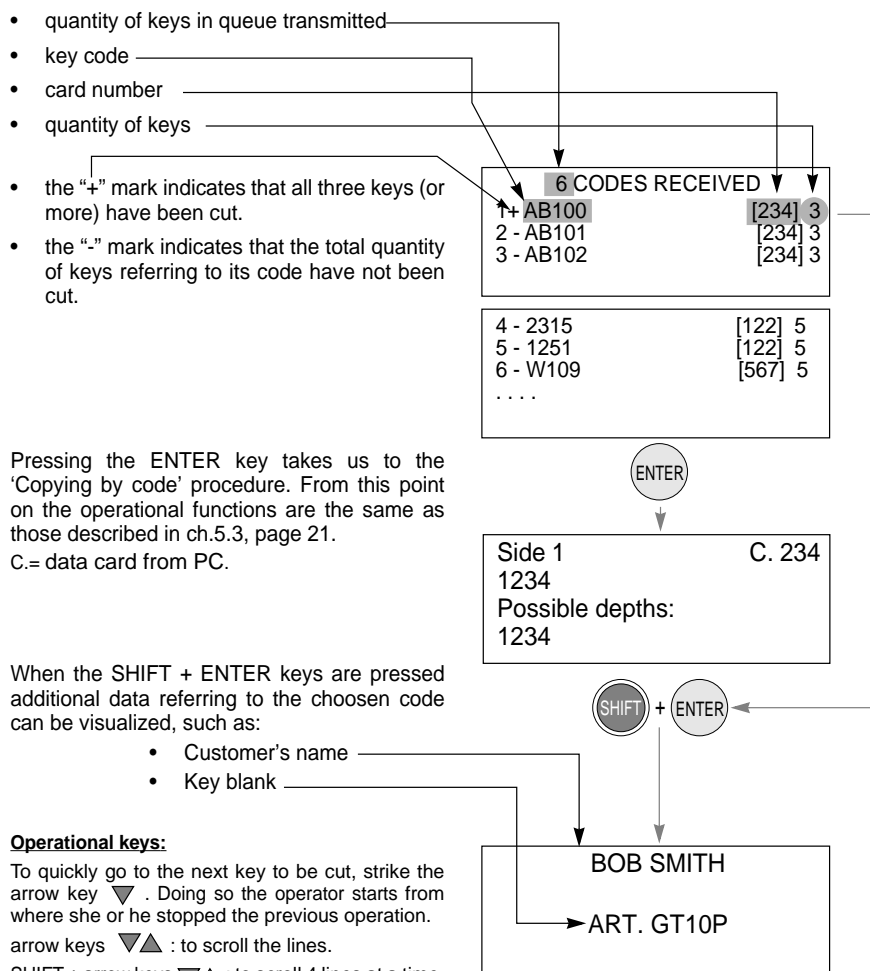
As described above, for each cutting process transmitted the number of pieces to be cut is set, a '+' sign shows when the cycle is finished.

The '+' sign warns the operator that the last cutting operation has been carried out.

Should a work queue be interrupted, turn off the ULTRACODE. When the machine is turned on again and the <PC queue> is called up, the list reappears, starting from the first line.

### 5.5.1 [3] QUEUE FROM PC

The data received from the PC are presented in one form only:



### 5.5.2 KEY DECODING (ONLY IF OPTICAL READER INSTALLED)

The decoding function by means of the optical reader can be activated only when using a PC. After the decoding function is launched from the program, the machine's display shows the following information:

**Ilco 50: the data card used.**

- 1) insert the key into the R100 optical reader's side jaw.
- 2) press START to begin the operation.

**NOTE:** if the key has 2 or more asymmetrical sides the machine's display will show the message "waiting for computer data". Each side of the key to be decoded will appear:

- the Software Program will then display the cutting data decoded from the machine.

Decode	ILCO 50
ORIGINAL on right.	
Jaw: 100/?	Pos.: 0
Side: 1	[START]

START

DECODING IN PROGRESS  
Side 1

Waiting for  
computer data!

Decode	ILCO 50
ORIGINAL on right.	
Jaw: 100/?	Pos.: 0
Side: 2	[START]

Decoding OK.  
See computer.

**ATTENTION:** if a key decoding/reading operation is started and the diameter of the cutting tool exceeds 2.3779 inch (e.g. cutter 06 Ø 2.543 inch), the display will show the following message:

Replace the cutter according to the instructions in Ch.4.6 "Changing the cutter", page 16.

ATTENTION !!  
Install cutter:  
01

ENTER

Is cutter: 01 installed?	No = STOP    Yes = ENTER
--------------------------------	--------------------------

## 5.6 [4] CALIBRATIONS

The following components on the machine have a specific 'self-setting' procedure with the use of regulating templates (Ch.1.5 "Accessories provided", page 7).

- VISE JAW
- CUTTERS

ADAPTERS provided as options do not require calibrating. However, if necessary adjustments can be made to the cutting data, according to the procedures described in Ch.5.6.4 "Manual adjustments", page 36.

In the circumstances listed below (see events) it may be necessary to re-set one or all of the jaws and/or cutters that the user has in possession. This operation is semi-automatic and requires close attention to the instructions listed below.

EVENT	MACHINE ZEROES	CALIBRATION (chap. , pag.30)	
		JAWS	CUTTERS
<b>Electronic board replacement</b>	YES (see ch.7.6, page 54)	YES (see ch.7.6, page 54)	YES (see ch.7.6, page 54)
<b>Replacement of sensors</b>	YES	NO	NO
<b>V100 vise jaw replacement</b> (with a new one of the same type)	NO	YES	NO
<b>Replacement of the cutter shaft</b>	YES	NO	NO
<b>Re-sharpening of existing cutter and/or cutter replacement</b> (with a new one of the same type)	YES	NO	YES
<b>Installation of optional jaws</b>	NO	YES (if applicable)	NO
<b>Replacement of the ball screws</b>	YES	NO	NO

- 1) Enter the 'Calibrations' menu #4.

### Operational keys:

use the arrow keys ▼▲ to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

1 - Cut by card  
 2 - Cut by code  
 3 - Queue from PC  
 4 - Calibrations      >>

ENTER

- 2) Select 'Jaws' #1.

1 - Jaws  
 2 - Cutters  
 3 - Adaptors

ENTER

### 5.6.1 CALIBRATING THE V100 VISE JAW

Before starting the vise jaw calibration, make sure that there are no keys and/or adaptors fitted in the V100 vise jaw.

### Operational keys:

SHIFT+ENTER: to select and visualize each side of the vise jaw (where applicable).

STOP: to exit the menu.

Jaws

 V100  
 V101  
 V102

ENTER

V100
SIDE A

 Adjustment: SIDE A  
 X = +00      Y = +00  
 To calibrate      [START]

START



- 3) replace the cutter with the (Z1) template (fig. 25). To remove the cutter follow the instructions on page 16, ch. 4.6 "Changing the cutter".
- 4) insert the (Z3) template to the side of the V100 vise jaw that is shown on the machine's display.
- 5) press START.

- this will automatically start the setting of the V100 vise jaw by means of electric contact between the two templates.

- the display shows the differences from the theoretical values.

- 6) to save the data press ENTER.

**ATTENTION:** if the STOP key is pressed, the new settings will be lost. If so, only the previous setting values will remain valid.

**NOTE:** the settings will be accepted only if the tolerances remain within a range between  $-11.8/+11.8$  thousandths of an inch.

- if the tolerances exceed the accepted range the machine's display will show an error message:
- carefully follow the instructions and repeat the procedure.

V100      SIDE A  
Install Z1 & Z3 temp.  
See operating manual  
[START]

START

V100      SIDE A  
Detection  
in progress!

V100      SIDE A  
X = +002      Y = +004  
Save data?  
No = STOP      Yes = ENTER

ENTER

Exceeded setting  
tolerance limit.  
See operating manual.

ENTER

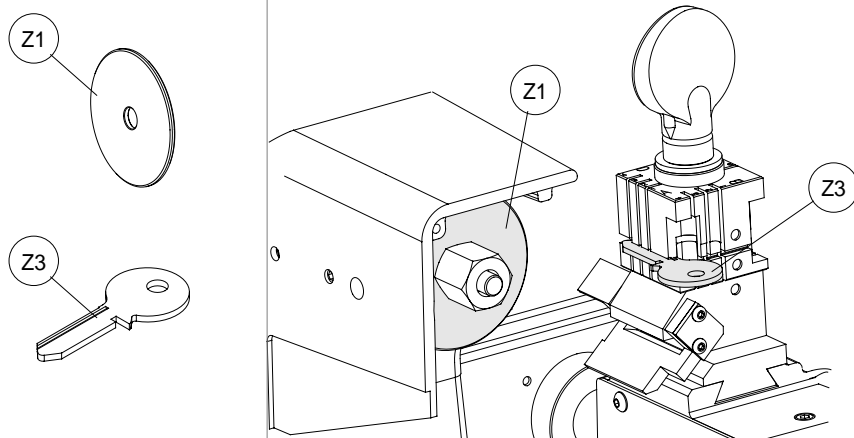


Fig. 25

- the operational sequence will continue and the display will show the settings for sides B, C and D.

- turn the V100 vise jaw to side B, insert the (Z3) template into the vise jaw and proceed with the settings, following the same procedure described for side A.

V100	SIDE B
Adjustment	SIDE B
X = +00	Y = +00
To calibrate	[START]

- turn the V100 vise jaw to side C, insert the (Z3) template into the vise jaw and proceed with the settings, following the same procedure described for side A.

V100	SIDE C
Adjustment	SIDE C
X = +00	Y = +00
To calibrate	[START]

ATTENTION: make sure that the (Z3) template is properly inserted into side C of the V100 vise jaw (see fig. 26).

- turn the V100 vise jaw to side D, insert the (Z3) template into the vise jaw and proceed with the settings, following the same procedure described for side A.

V100	SIDE D
Adjustment	SIDE D
X = +00	Y = +00
To calibrate	[START]

ATTENTION: make sure that the (Z3) template is properly inserted into side D of the V100 vise jaw (see fig. 26).

#### Operational keys:

use the arrow keys ▼▲ to directly select the side of the vise jaw you intend to set.

START: to begin the setting procedure.

STOP: to interrupt the setting procedure.

ATTENTION: after calibrating all sides of the V100 vise jaw:

- remove the (Z3) template from the V100 vise jaw.
- remove the (Z1) template from the cutter shaft replacing it with a cutter.

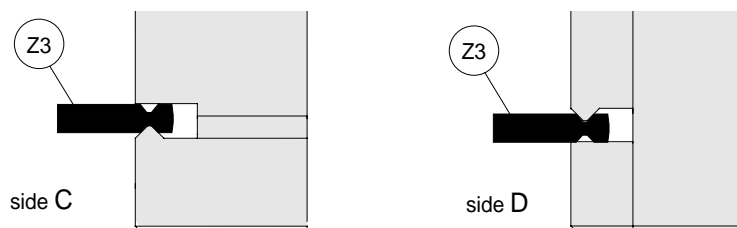


Fig. 26

## 5.6.2 CALIBRATING THE R100 JAW ( ONLY IF INSTALLED )

### - OPTICAL READER -

Before starting the jaw setting, make sure that there is no key and/or adapter fitted in the V100 cutter side jaw.

- 1) enter the 'Options' menu and select option 1 – 'Jaws'.

1 - Jaws  
2 - Cutters  
3 - Adaptors

ENTER

5 - R100

ENTER

R100  
Adjustment SIDE A >>  
X = +00 Y = +00  
To calibrate [START]

START

R100  
Install the Z3 template.  
See operating manual.  
[START]

START

R100 SIDE A  
Detection  
in progress!

R100 SIDE A  
X = +023 Y = +009  
Save data?  
No = STOP Yes = ENTER

ENTER

The >> symbol indicates that the selected jaw has more than one side.

#### **Operational keys:**

SHIFT+ENTER: to select and visualize each side of the jaw (where applicable).

STOP: to exit the menu.

- 2) fit the (Z3) template to side A of jaw R100 (fig. 27).

ATTENTION: lower the key gauge.

- 3) press START to proceed with automatic setting of side A.

- during this operation the settings are read by the optical reader.

- 4) press ENTER to save data.

ATTENTION: if the STOP key is pressed, the new settings will be lost. If so, only the previous setting values will remain valid.

NOTE: the settings will be accepted only if the tolerances remain within a range between -11.8/+11.8 thousandths of an inch.

- if the tolerances exceed the accepted range the machine's display will show an error message:
- carefully follow the instructions and repeat the procedure.

Exceeded setting  
tolerance limit.  
See operating manual.

ENTER

- the operational sequence will continue and the display will show the settings for sides B, C, D.

- turn the R100 jaw to side B, insert the (Z3) template into the jaw and proceed with the settings, following the same procedure described for side A
- turn the R100 clamp to side C, insert the (Z3) template into the jaw and proceed with the settings, following the same procedure described for side A

ATTENTION: make sure that the (Z3) template is properly inserted into side C of the R100 jaw (fig. 26).

- turn the R100 jaw to side D, insert the (Z3) template into the jaw and proceed with the settings, following the same procedure described for side A

ATTENTION: make sure that the (Z3) template is properly inserted into side D of the R100 jaw (fig. 26).

R100	SIDE B
Adjustment	SIDE B
X = +00	Y = +00
To calibrate	[START]

R100	SIDE C
Adjustment	SIDE C
X = +00	Y = +00
To calibrate	[START]

R100	SIDE D
Adjustment	SIDE D
X = +00	Y = +00
To calibrate	[START]

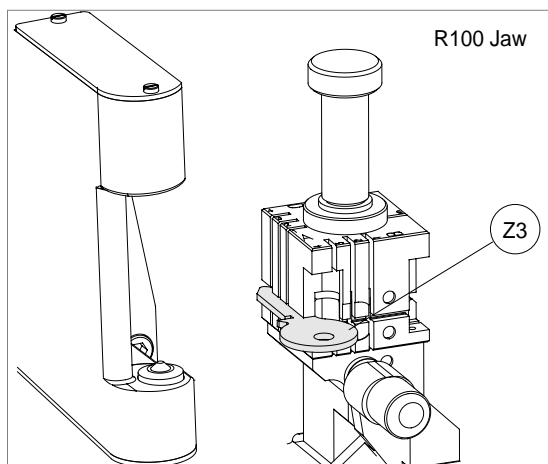


Fig. 27

### 5.6.3 CALIBRATING CUTTERS

For this procedure always use side A of the V100 vise jaw.

According to the cutter speed (determined by fitting the pulleys in the way described in ch.4.7, page 17) and material (chosen from the 'Options – cutter material' menu on page 42) the list will show all the HSS or carbide cutters (distinguished by the suffix 'W').

- 1) enter the "cutters" menu #2.

**Operational keys:**

use the arrow keys ▼▲ to move the cursor to select the required cutter and press ENTER.

- 2) fit the selected cutter to the machine.

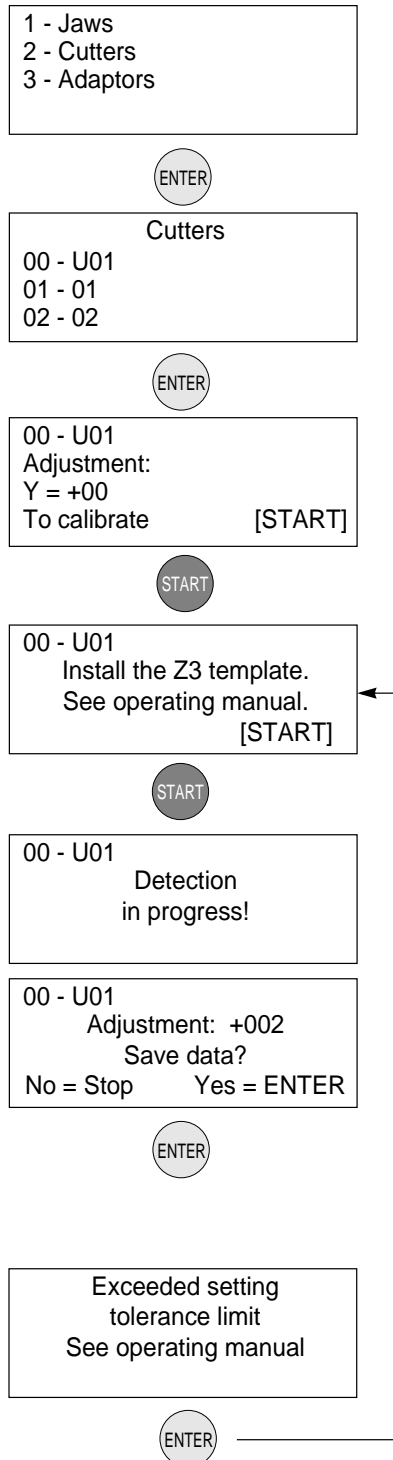
- 3) fit a brand new (Z3) template on side A of the V100 vise jaw and press START.

- the display shows the differences from the theoretical values.

NOTE: the setting will be accepted only if the tolerance of the cutter's diameter remains within a range between +39.3 /-39.3 thousandths of an inch.

- if the tolerances exceed the accepted range the machine's display will show an error message:
- carefully follow the instructions and repeat the procedure

ATTENTION: Once this operation is completed the (Z3) template must be thrown away; contact with the cutter, skims the surface of the template, these marks would cause errors if used for future settings.



### 5.6.4 MANUAL ADJUSTMENTS (JAWS – CUTTERS - ADAPTERS)

The operator may carry out manual adjustments by entering new X and Y parameter values.

**ATTENTION:** such adjustments should be made only when the automatic setting has already been carried out (where applicable).

Adjustments can be made within a range between +11.8 and -11.8 thousandths of an inch. To adjust jaws and adapters, the positive values of X will give the result shown in fig. 28.

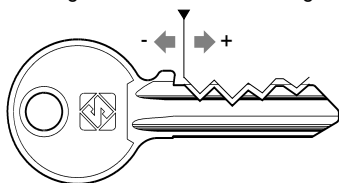


Fig. 28

For adjustments to cutters, clamps and adapters, the positive values of Y will give the result shown in fig. 29.

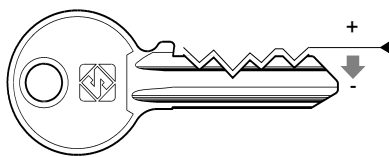


Fig. 29

The >> symbol indicates that the selected clamp has more than one side.

**Operational keys:**

place the cursor next to the parameter and enter the adjustment figure using the SHIFT + arrow keys ▼▲.

CLEAR: to zero out adjustments

ENTER or down arrow key ▼: to move the cursor from the X to the Y axis settings

ENTER: press in the final entry field to quit the menu.

STOP: to exit the menu

SHIFT+ENTER: to go from one side of the clamp to another when making manual adjustments.

**ATTENTION:** if the STOP key is pressed, the new settings will be lost. If so, only the previous setting values will remain valid

1 - Cut by card  
2 - Cut by code  
3 - Queue from PC  
4 - Calibrations >>

ENTER

1 - Jaws  
2 - Cutters  
3 - Adaptors

ENTER

**JAWS**

V100  
Adjustment SIDE A >>  
X = +00 Y = +00  
To calibrate [START]

ENTER

STOP

**Cutters**

00 - U01  
Adjustments:  
Y = +00  
To calibrate [START]

ENTER

STOP

**Adaptors**

B1  
Adjustments:  
X = +00 Y = +00

ENTER

STOP

Save adjustments ?  
No = STOP Yes = ENTER

Press START only if you intend to proceed with automatic calibration.

## 5.7 [5] MAINTENANCE

- 1) enter the 'Maintenance' menu #5.

### **Operational keys:**

use the ▼▲ keys to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

5 - Maintenance  
6 - Options



### 5.7.1 TESTS

There is an on board TEST menu that should be used to verify the cause of any breakdown that may occur to the machine.

1 - Test  
2 - Machine '0' point

- Test 0: OPTICAL READER (Only if installed)

Carefully follow the instructions that are on the machine's display. Check that the optical reader's status changes from OFF to ON.

NOTE: if the OFF/ON transition is not made, contact Ilco Technical Support.

- Test 1: X AXIS MOTOR

Carefully follow the instructions on the machine's display. Check that the X axis carriage moves.

**ATTENTION:** during this test function all end of run controls are disactivated; avoid moving the carriage up against its mechanical stops.

NOTE: if the motor does not start, contact Ilco Technical Support.

- Test 2: Y AXIS MOTOR

Carefully follow the instructions on the machine's display. Check that the Y axis carriage moves.

**ATTENTION:** during this test function all end of run controls are disactivated; avoid moving the carriage up against its mechanical stops.

NOTE: if the motor does not start, contact Ilco Technical Support.

- Test 3: CUTTER MOTOR

Carefully follow the instructions on the machine's display. Check that the cutter motor is working.

NOTE: if the cutter motor does not turn, contact Ilco Technical Support.

- Test 4: X AXIS SENSOR

- the machine's display should show ON when the carriage is drawn away from the machine (towards the operator).
- the machine's display should show OFF when the carriage is pushed all the way in towards the machine.

NOTE: if the ON/OFF transition is not made, contact Ilco Technical Support.

- Test 5: Y AXIS SENSOR

- the machine's display should show OFF when the carriage is moved all the way to the right.
- the machine's display should show ON when the carriage is moved all the way to the left (towards the cutter).

NOTE: if the ON/OFF transition is not made, contact Ilco Technical Support.



- Test 6: ELECTRIC CONTACT

Use any metal conductor to contact jaw to cutter, checking that the machine's display indicates OFF to ON.

---

NOTE: if the ON/OFF transition is not made, contact Ilco Technical Support.

- Test 7: KEYBOARD

One at a time, press all the keys (except STOP) checking that an asterisk (\*) appears for each key pressed. Press the STOP key for last.

---

NOTE: if the asterisk does not appear, contact Ilco Technical Support.

- Test 8: DISPLAY

All points on the display should be obscured.

---

NOTE: if this is not so, contact Ilco Technical Support.

- Test 9: SERIAL PORT

Check that the machine's display indicates OFF.

Fit the special (Z4) serial test connector (accessories provided) to the machine's serial port, checking that the machine's display indicates OFF to ON.

---

NOTE: if the ON/OFF transition is not made, contact Ilco Technical Support.

### 5.7.2 MACHINE ZERO POINTS

With the use of regulating templates (Ch.1.5 "Accessories provided", page 7) the machine provides a 'self-setting' procedure.

EVENT	MACHINE ZEROES	CALIBRATION (chap. , pag.30)		EVENT
		JAWS	CUTTERS	
<b>Electronic board replacement</b>	YES (see ch.7.6, page 54)	YES (see ch.7.6, page 54)	YES (see ch.7.6, page 54)	<b>Electronic board replacement</b>
<b>Replacement of sensors</b>	YES	NO	NO	<b>Replacement of sensors</b>
<b>V100 vise jaw replacement</b> (with a new one of the same type)	NO	YES	NO	<b>V100 vise jaw replacement</b> (with a new one of the same type)
<b>Replacement of the cutter shaft</b>	YES	NO	NO	<b>Replacement of the cutter shaft</b>
<b>Re-sharpening of existing cutter and/or cutter replacement</b> (with a new one of the same type)	YES	NO	YES	<b>Re-sharpening of existing cutter and/or cutter replacement</b> (with a new one of the same type)
<b>Installation of optional jaws</b>	NO	YES (if applicable)	NO	<b>Installation of optional jaws</b>

#### READING UNIT

##### Operational keys:

use the ▼▲ keys to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

##### Procedure:

- 1) enter the "Maintenance" #5.
- 2) select "Machine zero points" #2.
- 3) select "Reading unit" #2
- 4) remove R100 clamp (optical reader side) from its support.
- 5) install the (Z2) template, the clamp's bushing and secure them with the clamp's knob (fig. 39).

- the 'machine's zero' setting are detected by the optical reader.
- when this operation is completed, the machine's display will show the measured quotes

**ATTENTION:** if the STOP key is pressed, the new setting will be lost. If so, only the previous setting values will remain valid.

5 - Maintenance  
6 - Options

1 - Test  
2 - Machine '0' point

ENTER

Install Z1 & Z2  
templates.  
See operating manual.

ENTER

Move X and Y axis  
up until contact is made  
See operating manual.

START

TEMPLATE ERROR  
No contact made.  
See operating manual.

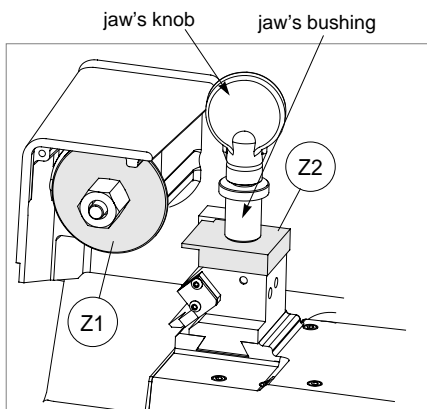


Fig. 30

## Regulating the Y axis sensor:

- use the provided allen key to loosen the (C1) grub screw; manually rotate the (C2) rod (fig. 31) in both directions up until the changeover point from OFF to ON is found.
- tighten the (C1) grub screw (fig. 31) to secure the rod.

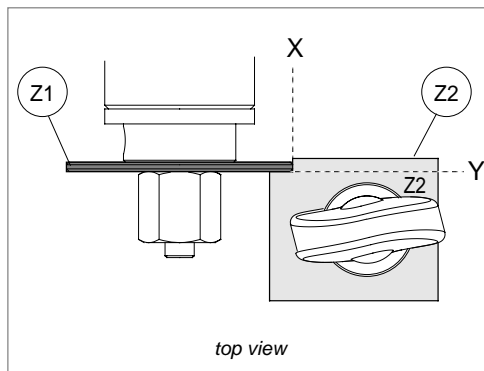
## Regulating the X axis sensor:

- carefully tip the machine over.
- remove the bottom panel by unscrewing all 8 securing screws.
- loosen the (C3) screw (fig. 32, page 41) that secures the sensor support plate. Manually move the sensor support plate up until the display's description goes from OFF to ON.
- tighten the (C3) screw (fig. 32, page 41) to secure the plate back into place.
- re-position the machine back on its workbench.
- press START.

- the 'machine's zero' settings are detected by electric contact.

- 6) when the operation has been completed, the display will show the measured quotes.
- 7) press ENTER to save the settings.

**ATTENTION:** if the STOP key is pressed, the new settings will be lost. If so, only the previous setting values will remain valid.



START

Pos. sensors.  
ICX = OFF      ICY = OFF  
See operating manual.  
[START]

Pos. sensors.  
ICX = OFF      ICY = ON  
See operating manual.  
[START]

Pos. sensors.  
ICX = OFF      ICY = OFF  
See operating manual.  
[START]

Pos. sensors.  
ICX = ON      ICY = ON  
See operating manual.  
[START]

START

Zero detection  
in progress!

Measured quotes:  
X = 4444      Y = 3333  
Save measurements?  
No = STOP      Yes = ENTER

ENTER

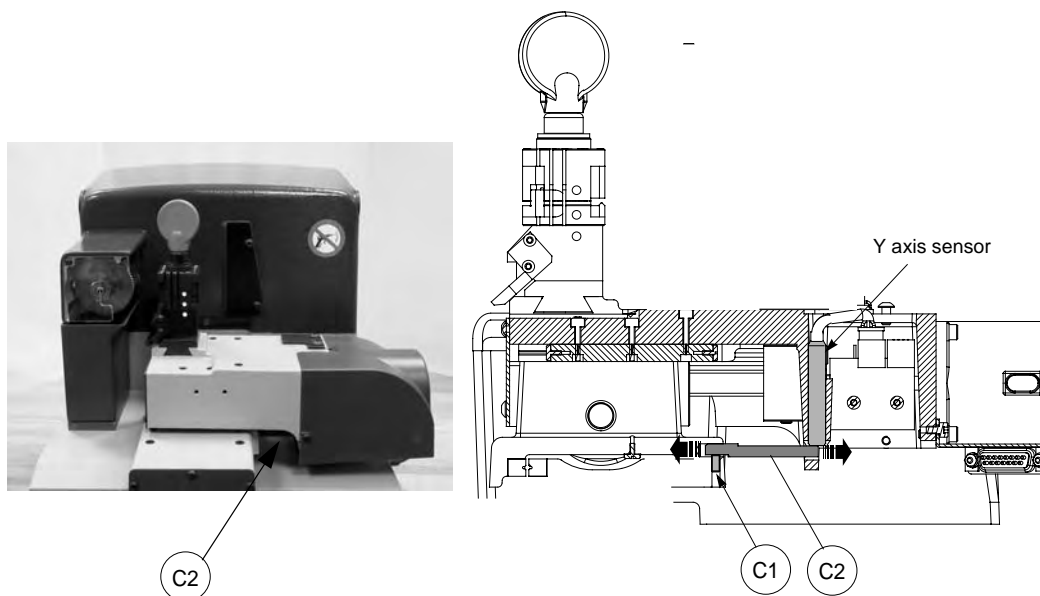


Fig. 31

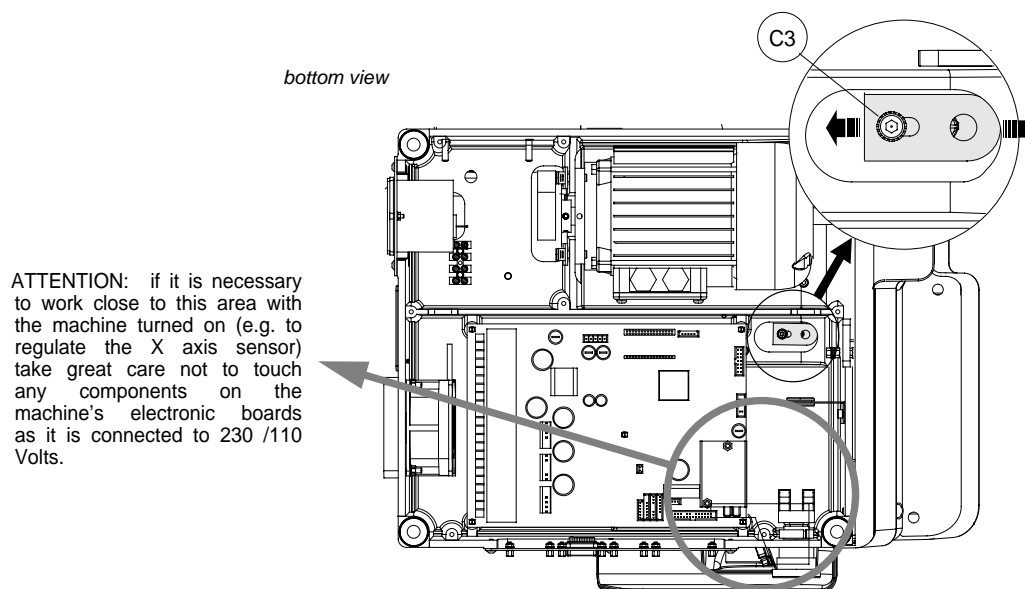


Fig. 32

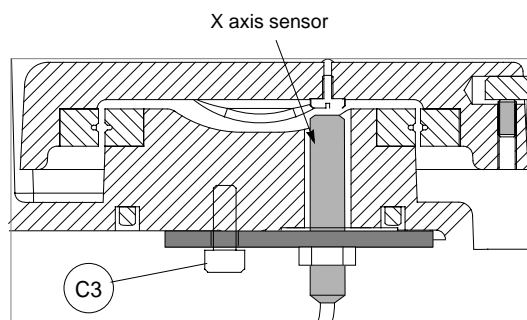


Fig. 33

## 5.8 OPTIONS [6]

1) Enter 'Options' menu # 6.

### **Operational keys:**

use the ▼▲ keys to move the cursor to the option required and press ENTER or directly press the numbered key corresponding to the option number.

5 - Maintenance  
6 - Options

ENTER

1 - Serial No.  
2 - Optical Reader  
3 - Cutter material  
4 - Cutting speed >>

5 - Carriage speed  
6 - Preference  
7 - Language  
8 - Inversion keyboard >>

9 - Min. distance  
10-Modify keys stop

### **1 - SERIAL NUMBER:**

displays the machine's serial number that should correspond to the Serial Number that is stamped on the back of the machine.

#### **Model :**

type of Ultracode.

#### **Keys cut :**

numbers of keys cut.

#### **SW Version :**

Software version of the program installed on the machine.

Ser. n: 153214523123  
Model : UltraCode  
Keys cut : \_ \_ \_  
SW Version : \_.\_.\_

### **2 - OPTICAL READER**

Set by Ilco Technical Assistance

Opt.Reader installed = 0  
( 0 = NO    1 = YES )  
Speed = 350  
(100-350)

### **3 - CUTTER MATERIAL:**

The option 'cutter material' shows all the HSS (enter 0) or carbide (enter 1) cutters.

By inverting the two pulleys two cutter rotation speeds can be obtained:

- low speed for HSS cutters
  - high speed for hard metal carbide cutters
- Inversion of the pulleys gives the first or second speed according to the method described in Ch.4.7, page 17.

Cutter Material = 0  
(0 = HSS        )  
(1 = Hard metal )  
See operating manual

**4 - CUTTING SPEED:**

Corresponds to the carriage advancement speed during the key cutting operation:  
On the basis of the cutter material selected, speed can be altered as shown in the table.

Cutting speed	
HSS	Hd. Met.
300	400
(100-400)	(200-700)

cutter metal	Recommended speed	Speed Range
HSS	300	100-400
Hard metal carbide	400	200-700

**5 - CARRIAGE APPROACH SPEED:**

This is the speed at which the carriages move towards the cutting area, before starting the cutting cycle.  
We recommend to operate the machine with the speed that is set (4000). If required, the operator can adjust the carriage approach speed from a minimum of 1000 to a maximum of 5000.

Carriage approach  
speed = 4000  
(1000 - 5000)

**6 - PREFERENCES:**

work parameters are chosen from this menu.

**Inches or millimetres:**

choose the measurements you intend to work with (mm = millimetres, inch. = inches).

**Start-up menu:**

choose the function in the Main menu that you would like to appear first when the machine is turned on:

- \* = Main menu
- 1 = Cut by card
- 2 = Cut by code
- 3 = Queue from PC
- 4 = Calibrations

Attention: press the "CLEAR/COPY" key to void any selection made and to select the (\*) main menu function.

**Preferred MFG:**

e.g. when '0' is set, the display shows the following when the machine is turned on:

1-Measurement Unit  
2-Start Menu (\*)  
3-Preferred MFG

Measurement Unit =  
( INCH = 1 )  
( Millimetres = 0 )

Menu selection  
0-Copy from original  
1-Cut by card  
2-Cut by code  
3-Queue from PC

MFG Selection :  
0- All MFG  
1-\* ALFA ROMEO  
2- BMW  
3-\* CADILLAC  
4- DODGE

**7 - LANGUAGE:**

enter the number that corresponds to the language you intend to work with.



Select language = 2

1 : English  
2 : Français  
3 : Español



**8 - KEYBOARD INVERSION**

This function inverts the alphanumerical keyboard (numbers to letters (fig. 9, page 12).

With "Inversion keyboard" disactivated (0) :

- to digit number 1: press 
- to digit the letter H: press SHIFT + 

With "Inversion keyboard" enabled (1) :

- to digit number 1: press SHIFT + 
- to digit the letter H: press 

Inversion keyboard  
function = 0  
(1 - enabled)  
see Operating manual

NOTE: this function can be carried out from the main menu "Cut by card" and/or "Cut by code"

**9 - MINIMUM DISTANCE:**

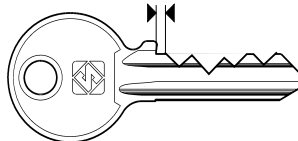
The number shown on the machine's display represents the X axis distance between the key blank shoulder and the beginning of the first cut (fig. 34). This function is extremely important with keys that require cuts on both, sides as it ensures precise positioning on the keys 2nd side.

Fig. 34

The set figure is 19.7 thousandths of a inch, which can be varied between min.0 - max. 38.9 thousandths of a inch.

ATTENTION: settings that are too high may render precise cuts impossible, with the following message on the display:

Min. distance  
of cut from key stop = .197  
(0 - 3.89)



Min. Parameter of  
DISTANCE FROM STOP  
is incompatible with  
selected card!

**10 - MODIFY KEYS STOP:**

Normally the machine does not require key shoulder stop adjustment.

If required, it is possible to modify the key's shoulder according to the modification made to the key shoulder (fig. 35).

If the operation is to be confirmed, the X and Y figures are both required:

**X thickness:**

measurement of the shoulder stop to be cut is expressed in hundredths of a inch (min.0 - max.3.89).

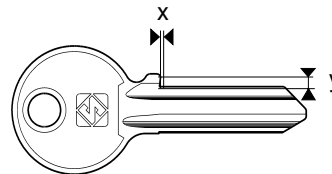
**Y height:**

height of the shoulder read on the key using a calliper, expressed in hundredths of a mm. E.g.:

- X = 0.197 inch = 19.7 thousandths
- Y = 0.118 inch = 11.8 thousandths

Fig. 35

Modify key stop	
Enabled = 0	(0-1)
Thickness X =	0
Height Y =	.118





## 5.9 ERROR MESSAGES

- The selected data card is for a different jaw from the one installed on the machine. Install proper jaw.

Data card not  
compatible with  
jaw installed!

- The entered data card number is not available in the machine's data base.

Data card  
not available!

- The entered cuts cannot be carried out (see Ch.5.3.1, page 22)

Non-feasible  
combination!

- This message appears when the cutter must be changed with one that is compatible to the type of cuts required for the entered data card number.

ATTENTION !!  
Install cutter:  
U01

- This jaw is not available in the machine's data base.

Jaw not  
available!

- This cutter is not available in the machine's data base.

Cutter not  
available!

- This adaptor is not available in the machine's data base.

Adaptor not  
available!

- The entered data card number requires a type of cut that is not available in the machine's data base.

Type of cut  
not available!

- The minimum distance from the key stop position overlaps the first cut on the key (Ch.5.8, page 42).

MIN. Parameter of  
DISTANCE FROM STOP  
is incompatible with  
selected card!

- This message appears when the cutter is unable to identify the keys measurements when cutting by means of electric contact.

POSITION ERROR  
Key not  
properly installed!

- During the cutting cycle one or more depth exceeded the maximum limit. These depths are automatically aligned to the maximum permitted depth.

**ATTENTION**  
Depth limit  
exceeded!

- The automatic setting revealed a variation that exceeded the permitted nominal figure setting reference. Carefully repeat the setting procedure.

Exceeded setting  
tolerance limit  
See operating manual

- During the setting of the "machine's zero points" there is a contact failure between the two templates (see ch.5.7.2, page 39).

**TEMPLATE ERROR**  
no contact made.  
See operating manual

- Indicates that the entered function is not yet available.

Non-feasible  
function !

- The electronic control board has exceeded the maximum permitted temperature. Check the cooling fan (ch. 7.1 "Trouble shooting", page 49).

**TEMPERATURE ALARM**

Turn the machine off!

- Indicates that the fuse has blown due to a short circuit in an inlet or outlet (ch. 7.1 "Trouble shooting", page 49).

**I/O POWER ALARM**  
Check fuse F4 !

- Indicates a short circuit in port P (IN/OUT) (ch. 7.1 "Trouble shooting", page 49).

**DIGITAL OUTLET  
PROTECTION ALARM**  
Turn the machine off !

- Indicates that the fuse has probably blown (ch. 7.1 "Trouble shooting", page 49).

**CUTTER MOTOR  
ALARM**  
Check fuse F1 !

- Indicates a fault on the electronic control board.

**CUTTER MOTOR  
ALARM**  
Fault on motor circuit !

## 6 CLEANING

- keep the operational parts of the machine as clean as possible by brushing away the chippings in areas where they accumulate during cutting operations.
- under no circumstances must compressed air be used to clear the work zone of chippings as this will blow them onto the moving parts.
- Never use oily products or thinners for cleaning painted surfaces, jaws, electrical or electronic connections.

## 7 MAINTENANCE

Although the ULTRACODE key-cutting machine does not require special maintenance, it is advisable to check and, if necessary, replace the parts subject to wear and electric/electronic parts (fuses, circuit boards, etc.) in the event of faulty operation.

Replacement is simple and can be carried out by the operator consulting the instructions.

Before starting any type of maintenance (controls or replacements), read the instructions below:

- never carry out maintenance with the machine switched on
- always remove the main power supply cable
- strictly follow all the instructions in the manual
- use original spare parts (see Spare Parts sheet provided).

### 7.1 TROUBLE SHOOTING

FAULT	PROBABLE CAUSE	
Machine is on, with no message on its display.	check to see if the back fan is working	
	not working:	a) emergency button activated
		b) general fuses in the power socket are faulty
	working:	a) fuse F3 on electronic control board is faulty
		b) connection wire between display and electronic circuit board loose
		c) defective display
cutter motor not working.	a) the F1 fuse on the electronic control board is faulty	
	b) motor wire not properly attached to the connector	
	c) defective electronic control board	
	d) motor cut-off WARNING: this may derive from inappropriate or heavy use of the key-cutting machine or a fault with the motor itself. DO NOT USE THE MACHINE and call Ilco Technical Dept. to determine the cause of activation of the cut-off.	
X, Y and B axes motors are not working.	None of the motors working:	a) fuse F2 on the electronic control board faulty
		b) the wiring between the transformer and electronic control board is loose or the connector is not seated properly.
		c) defective electronic control board
	Only one motor is not working:	a) the connection wires between the motor and the electronic control board are loose or the connector is not seated properly
		b) defective electronic control board
Keyboard not working (partially or completely)	a) the keyboard connector is not properly connected to the interface board (fig. 36)	
	b) the wiring between the keyboard/display unit and electronic control board is not properly attached to the relative connectors	
	c) defective keyboard	
	d) defective electronic control board	
Electric contact not working (during calibrating or cutting).	a) wiring between the J14 connector on the electronic control board and cutter shaft is loose or disconnected	
	b) wiring inside the Y axis carriage is not seated properly or disconnected	
	c) brass shavings on cutter shaft behind cutter	
	d) defective electronic control board	

FAULT	PROBABLE CAUSE	
Key-cutting machine fails to communicate with computer.		a) wiring between 9-pin serial port and electronic circuit board not seated properly or disconnected
		b) serial cable between key-cutting machine and computer is faulty
		c) computer serial port is not functional
		d) defective electronic control board
The display shows the message 'TEMPERATURE ALARM - Turn the machine off'.	check that the fan on the back of the key-cutting machine is working:	
	not working	a) fan faulty
		b) electronic control board faulty
	working	electronic control board faulty
The display shows the message: 'I/O POWER ALARM – check fuse F4'.	a) fuse F4 on the electronic control board faulty.	
	b) short circuit on the inlets. To find which inlet is causing the error message, disconnect the J7-8-14-20 connectors one at a time and check each time whether the alarm disappears.	
The display shows the message: 'DIGITAL OUTLET PROTECTION ALARM - turn the machine off'.	internal fault on the electronic control board.	
The display shows the message: 'CUTTER MOTOR ALARM - check fuse F1'.	a) fuse F1 on the electronic control board faulty.	
	b) cutter motor wiring disconnected.	
	c) internal fault on the electronic control board.	

## 7.2 MAINTENANCE OPERATIONS

- Cutter replacement
- Belt replacement and tension adjustment
- Fuse check and replacement
- Electronic circuit board replacement
- Keyboard/display replacement
- Access to back compartment
- Access to bottom compartment
- Sensor replacement
- WIN-TRANSFER program for loading/updating the machine program

## 7.3 CUTTER REPLACEMENT

- 1) turn the machine off and unplug it.
- 2) remove the cutter protective shield (1) by loosening the screw (1a).
- 3) slide the cutter release rod (2) into the hole located on the left side of the machines cutter shaft chassis (fig. 36).
- 4) loosen the cutter locking nut (4) by turning it clockwise with the 19 mm socket wrench (3) provided with the machine.

ATTENTION: the thread is left-handed (reversed).

- 5) replace the cutter, then tighten the nut (4) by turning it counter-clockwise and remove the rod from its hole.
- 6) place the cutters protective shield (1) back into position securing it with the screw (1a).

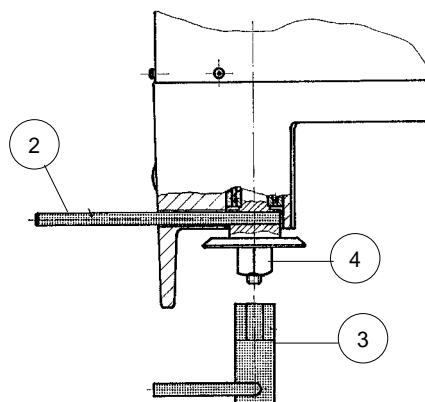
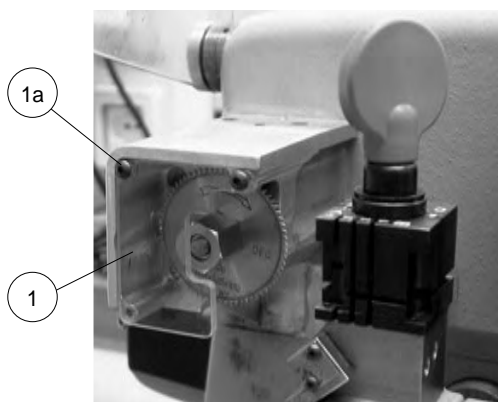


Fig. 36

WARNING: when replacing a worn cutter with a new one or with a re-sharpened cutter consult Ch. " ", page 29.

## 7.4 BELT REPLACEMENT AND TENSION ADJUSTMENT

To replace the belt, proceed as follows:

- 1) turn the machine off and unplug it.
- 2) remove the back panel (Ch.7.8, page 56).
- 3) remove the bottom panel (Ch.7.9, page 56).
- 4) loosen the 4 screws (W) securing the motor (fig. 37).
- 5) remove the worn belt from the pulleys.
- 6) fit the new belt onto the pulleys, making sure that the direction of rotation is correct.
- 7) using the provided belt tension plate and the (W2) screw (fig. 37) adjust the belt's tension by turning the (W2) screw.
- 8) tighten the 4 (W) (fig. 37) screws back into place, securing the motor.
- 9) remount the back and bottom panel.

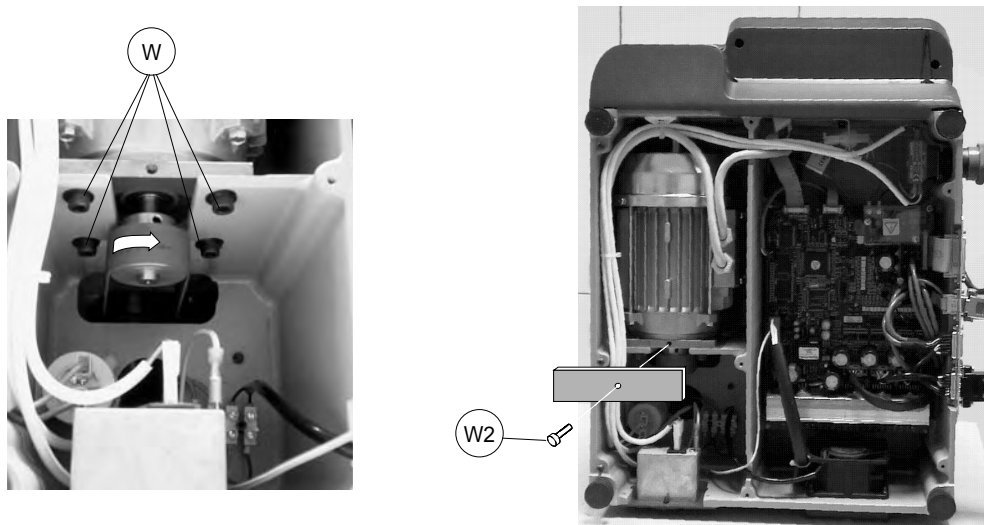


Fig. 37

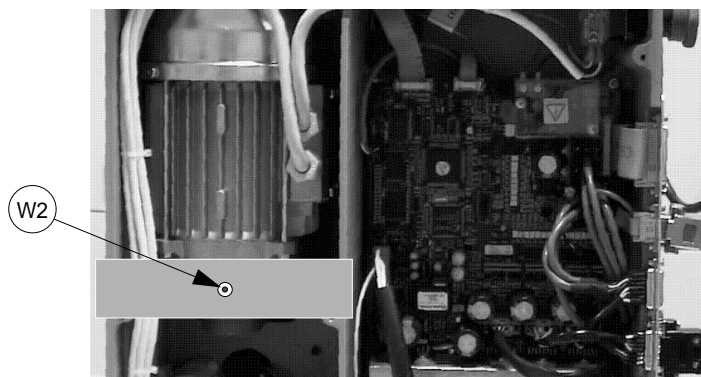


Fig. 38

To adjust belt tension proceed as follows:

- 1) turn the machine off and unplug it.
- 2) remove the bottom panel (Ch.7.9, page 56).
- 3) loosen the 4 screws (W) securing the motor (fig. 37).
- 4) using the provided belt tension plate and the (W2) screw (fig. 37) adjust the belt's tension by turning the (W2) screw.
- 5) tighten the 4 (W) (fig. 37) screws back into place, securing the motor.
- 6) remount the bottom panel.

## 7.5 CHECKING AND/OR REPLACING FUSES

Fuses should be checked with a tester (ohmmeter, multimeter, etc.) as they may appear to be in good condition even when they are electrically faulty. Fuses must always be replaced with the same amperage and type (rapid or delayed), as indicated in this manual. There are 6 fuses in the ULTRACODE.

- 2 fuses: 6.3 Amps rapid

located next to the power socket on the back of the machine, next to the main switch (fig. 39). These fuses protect the machine from power surges and/or spikes in the electricity supply. To check and/or replace the fuses proceed as follows:

- 1) turn the machine off and unplug it from its power supply cable.
- 2) use a flat screwdriver to open the flap covering the socket, remove and check the fuses, replacing them if necessary.

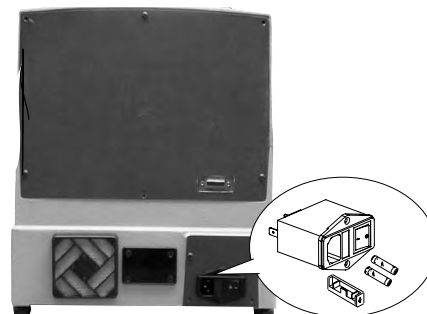


Fig. 39

- 4 fuses: F1, F2, F3, F4

F1: 10 Amps delayed

- protects the cutter motor and its electronic controls

F2: 6,3 Amps delayed

- protects the step motors and their electronic controls (+32V d.c.)

F3: 4 Amps delayed

- protects the logic control circuits on the microprocessor board (+5V d.c.)

F4: 2 Amps delayed

- protects the digital output circuits for the low voltage controls and the sensor inlets (+24V d.c.)

Situated on the electronic circuit board inside the base of the machine (fig. 40) protecting the board from short circuits.

To check and/or replace the fuses proceed as follows:

- 1) turn the machine off and unplug it from its power supply cable.
- 2) remove the bottom panel (Ch.7.9, page 56).
- 3) check and, if necessary, replace the fuses in the way described below:

to remove the fuse:

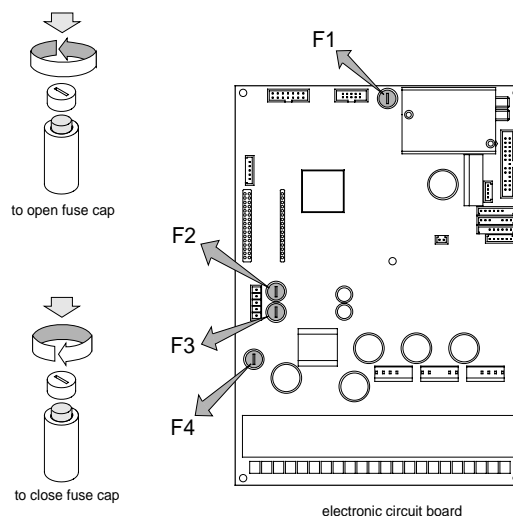
- press the fuse cap with your fingers and turn it counter clockwise.

To fit the new fuse:

- carefully position the fuse back into place, then gently press the fuse cap downwards turning it clockwise.



Fig. 40





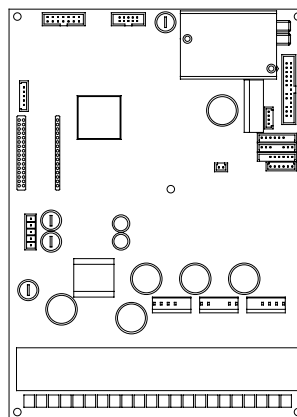
## 7.6 ELECTRONIC CIRCUIT BOARD REPLACEMENT

If the board still communicates with the P.C. it is possible to save the data of the machine's original settings using the WIN-TRANSFER program disk that is provided along with the machine (see Ch.7.11, page 51).

- use the function 'Save settings'.
- replace the electronic circuit board:
  - 1) turn the machine off and unplug it from its power supply cable.
  - 2) remove the bottom panel (Ch.7.9, page 56).
  - 3) disconnect all cable connectors from the electronic circuit board (fig. 41).



Fig. 41



electronic circuit board

- 4) take the electronic circuit board off by unscrewing the (Y1) nuts off (fig. 42).
- 5) mount the new electronic circuit board and re-connect all cables (all cable connections are polarised therefore cannot be connected incorrectly).
- 6) re-fit the bottom panel and re-position the machine on its workbench.
- 7) turn the machine on and launch the WIN-TRANSFER program.
- 8) If the settings have been saved, launch the 'Recover settings' function. If not, carry out the setting operations (Ch.5.7.2 "Machine zero points", page 39 and Ch., page 29).

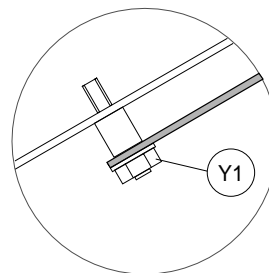


Fig. 42

## 7.7 KEYBOARD/DISPLAY REPLACEMENT

- 1) turn the machine off and unplug it from its power supply cable.
- 2) remove the display's support, by unscrewing the 3 (B1) fixing screws (fig. 43).
- 3) detach the flat cable and ground wire from the keyboard (fig. 44).
- 4) unscrew the keyboard's fixing nuts and remove the keyboard from its support.
- 5) fit the new keyboard/display, repeating the operations described above, backwards.

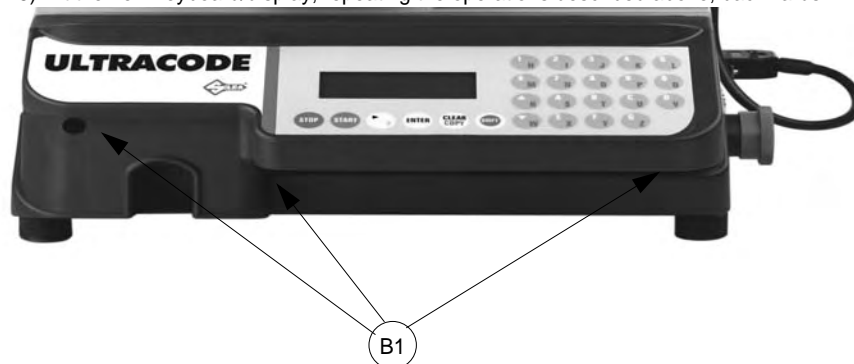


Fig. 43

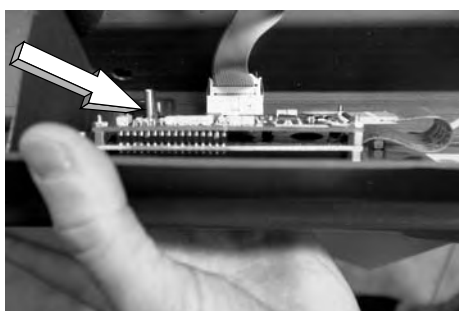


Fig. 44

## 7.8 ACCESS TO BACK COMPARTMENT

To gain access to the back compartment, proceed as follows:

- 1) turn the machine off and unplug it from its power supply cable.
- 2) unscrew the 6 (M1) screws that secure the back panel (fig. 45) thus removing it.

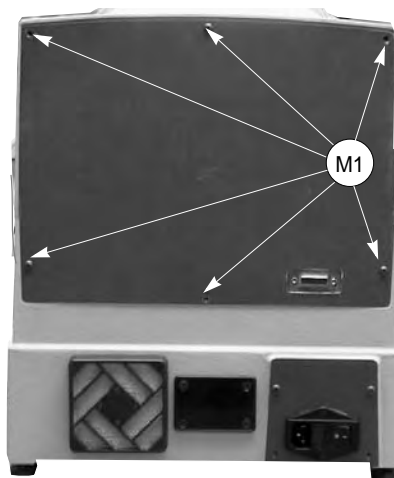


Fig. 45

## 7.9 ACCESS TO BOTTOM COMPARTMENT

To gain access to the bottom compartment, proceed as follows:

- 1) turn the machine off and unplug it from its power supply cable.
- 2) turn the machine on its back side.
- 3) remove the machine's bottom panel by unscrewing the 8 (L1) screws.

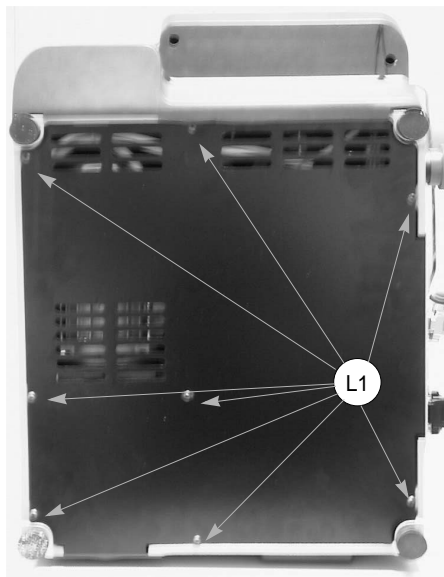


Fig. 46

## 7.10 SENSOR REPLACEMENT

### ***X AXIS SENSOR REPLACEMENT***

- 1) turn the machine off and unplug it from its power supply cable.
- 2) remove the bottom panel (chap.7.9 "Access to bottom compartment").
- 3) disconnect the X axis sensor's connector from the electronic circuit board (fig. 47).
- 4) loosen the (L3) nut. Unscrew the sensor from the plate and remove it (fig. 48).
- 5) remove the front cover on the (X axis) lower carriage (fig. 49) by unscrewing the 3 (B4) screws.
- 6) fit the new sensor in position, tightening it until it almost touches the (L2) screw (fig. 48) thus securing it with the (L3) nut.
- 7) connect the sensor's connector to the electronic circuit board.
- 8) remount the bottom panel and front cover.

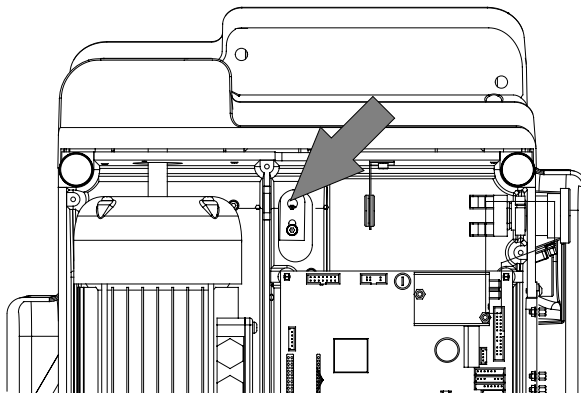


Fig. 47

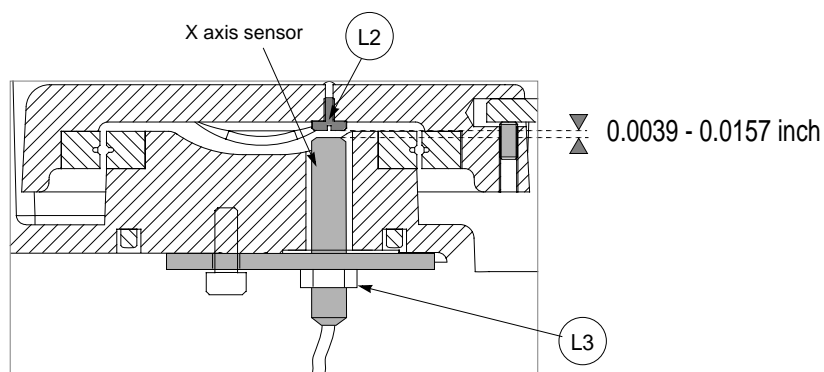


Fig. 48

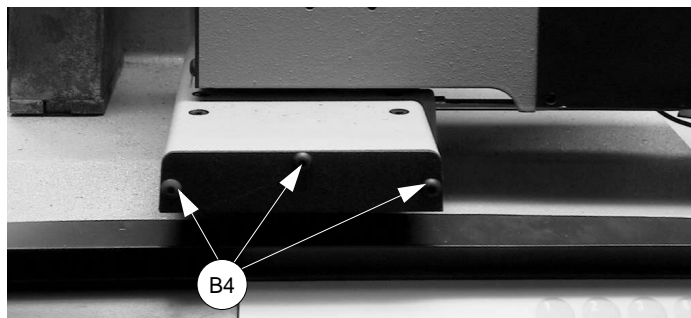


Fig. 49

**Y AXIS SENSOR REPLACEMENT**

- 9) turn the machine off and unplug it from its power supply cable.
- 10) raise the protective shield.
- 11) disconnect the (J1) Y axis cable from the carriage (fig. 50).
- 12) remove the Y axis carriage cover by unscrewing the 3 (B5) locking screws and pull the cover in the direction shown in fig. 50.
- 13) disconnect the (M3) sensor's connector (fig. 51).
- 14) slightly loosen the (M2) grub screw with the provided allen key.
- 15) remove the faulty sensor and replace it with a new one. Screw it in until it almost touches the underlying rod (fig. 52). Tighten the (M2) grub screw to lock the sensor into place.
- 16) connect the (M3) sensor's connector.
- 17) replace the Y axis carriage cover.
- 18) connect the (J1) Y axis connecting wire to the carriage.

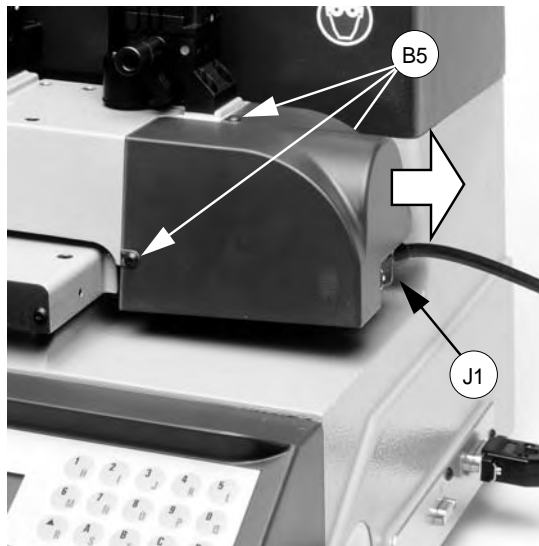


Fig. 50

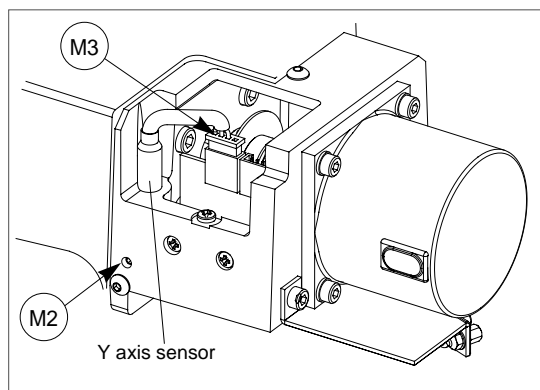


Fig. 51

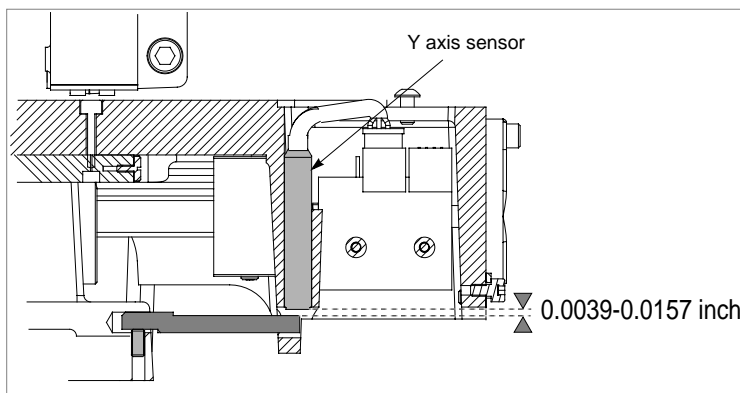


Fig. 52

## 7.11 WIN-TRANSFER PROGRAM FOR LOADING/UPDATING THE INTERNAL MACHINE PROGRAM.

The machine is supplied with an internal program already loaded and tested at Ilco Unican Corp. The user therefore does not need to carry out any operations.

Only in the situations described below can the WIN-TRANSFER program be used to re-start the machine. The following is a list of situations where the use of the WIN-TRANSFER program is required.

For further details on installation and use of the program, follow the instructions given on the instruction sheet provided with the disk.

- Replacement of the electronic board (see ch. 7.6, page 54) or loss of the internal machine program.
  - 1) replace the board with a new one, if necessary.
  - 2) install on your personal computer the latest version received of the WinTransfer program and follow the instructions given on the instruction sheet provided with the program.
  - 3) read the serial number on the data plate on the back of the machine (ch.5.9, page 42) and enter on the machine.
  - 4) gauge the machine according to the instructions in the manual, as follows:
    - gauge as explained in chapter 5.7.2 "Machine zero points" in the user's manual.
    - gauge the V100 vise jaw (ch. 5.6.1, page 30).
- At this point the machine is set up and ready for operation
  - 1) install on your personal computer the latest version received of the WinTransfer program and follow the instructions given on the instruction sheet provided with the program.
- Loading of customized key data cards provided by ILCO on Customer's request
  - 1) install on your personal computer the latest version received of the WinTransfer program and follow the instructions given on the instruction sheet provided with the program.

## 8 DISPOSING OF MACHINE

To dispose the machine, it must be rendered unusable by carrying out the operations listed below:

- deactivation of the electricity supply;
- separation of the plastic and metal parts;

When these operations have been carried out, the machine can be disposed of according to the current regulations in the country of use.

### WASTE DISPOSAL

The ULTRACODE is made up of recyclable parts.  
Recycling is ecologically recommended.

#### Packing

The packing in which the machine is transported is made of cardboard and wood therefore can be re-used if intact or if dismantled used as combustible materials.

Warning! Take great care when dismantling the packing as it contains nails, which could cause injuries. We recommend to bend the nails downwards into the box with a hammer or to completely remove the nails disposing them in authorized metal recycling centres.

The packing is considered solid urban waste and must not be thrown into the environment but placed in special cardboard collection bins.

#### Waste deriving from key cutting

The waste deriving from key cutting is classified special waste, but is still classified as solid urban waste, as metal wool. Such waste must be disposed of in special collection centres according to the classification assigned to them by the current EEC law. The circumstances which transform metal residue from solid urban waste into contaminated or toxic noxious waste are listed in the appendices to the current European Union regulations regarding disposal of such waste.

Waste is any substance or object deriving from human activity or natural cycles, disposed of or to be disposed of.

## 9 ASSISTANCE

Ilco provides full service to purchasers of the ULTRACODE key-cutting machine. To ensure complete safety to the operator and machine, any job not specified in this manual should only be carried out by the Ilco Technical Support.

It is our hope that this ULTRACODE Operating Manual will enable you to quickly and efficiently set up, and begin using your new ULTRACODE key machine. For more detailed information, trouble shooting practices, common maintenance tips, and useful photos, please contact Ilco Technical Assistance. We strongly advise you to keep this document safe and readily available. It will prove very useful in the future. Should you require addition assistance or support, please feel free to contact the IlcoTechnical Assistance Dept.

Ilco Technical Assistance Dept.  
400 Jeffreys Road  
Rocky Mount, NC 27804  
USA

Tel: 1-800-ILCO-USA  
1-800-(452-6872) Ext: 200, 384, 356

Fax: 252-446-4702

### 9.1 HOW TO REQUEST SERVICE

The guarantee attached to the ULTRACODE ensures free repairs or replacements of faulty parts within 12 months of the date of purchase. For other services, please contact Ilco Technical Assistance Dept.



USA: 400 Jeffreys Road  
Rocky Mount, NC 27802-2627  
Telephone: 252-446-3321  
Fax: 252-446-4702

Canada: 7301 Decarie Blvd  
Montreal, Que. H4P 2G7  
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